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# The Mining Journal,

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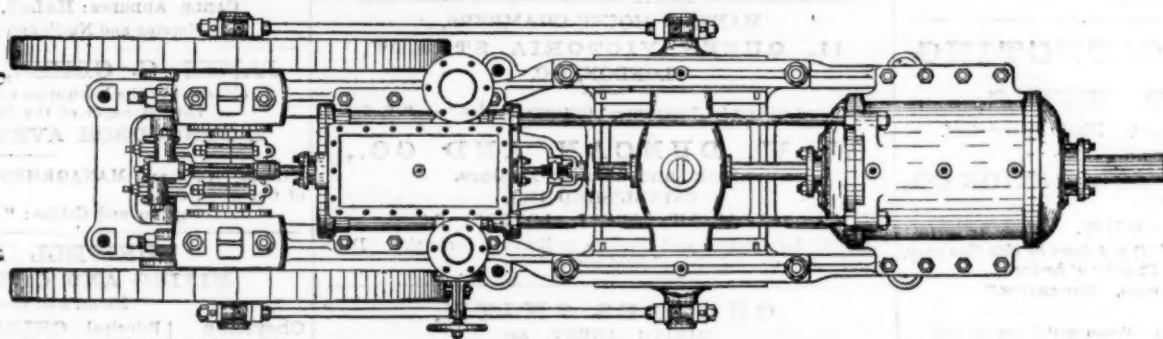
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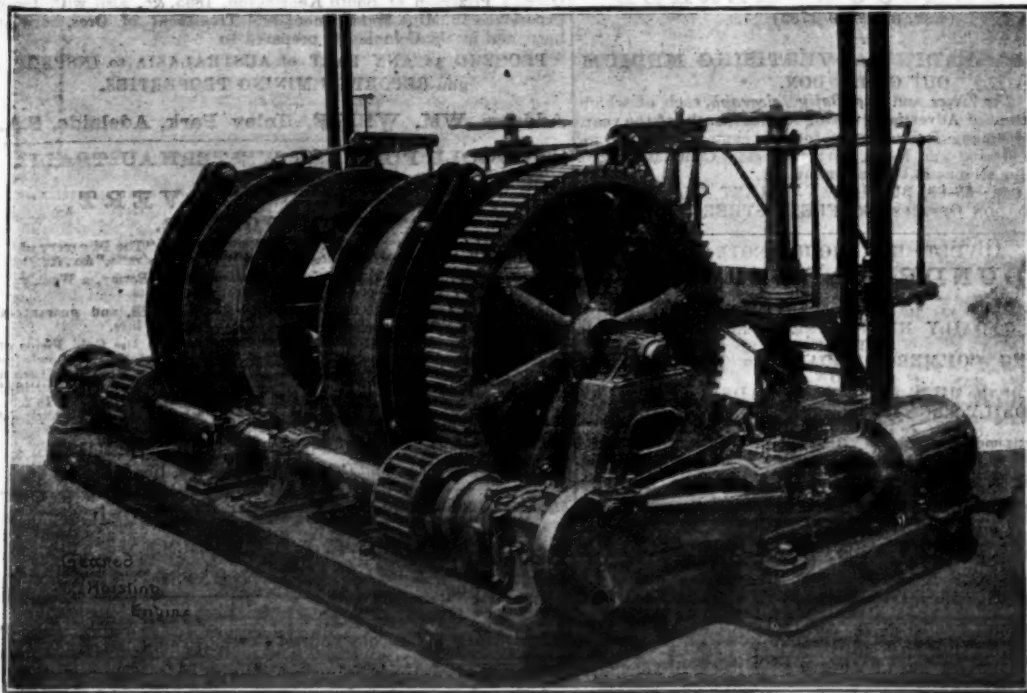
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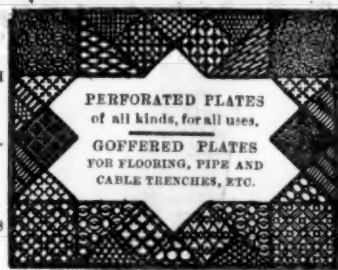
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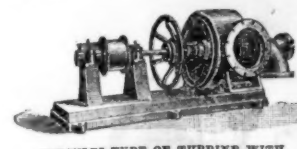


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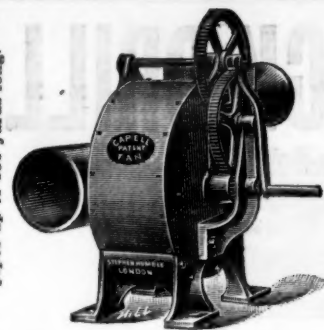
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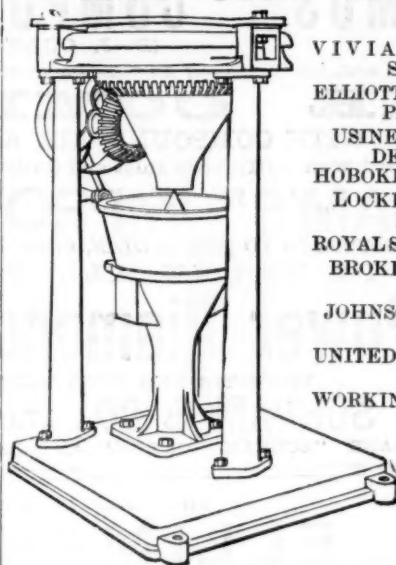
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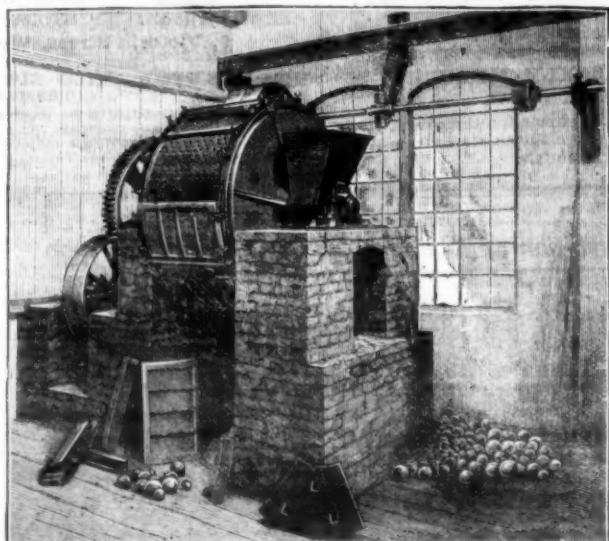
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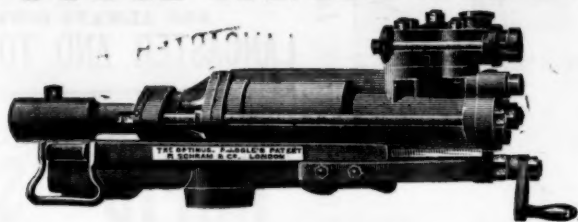
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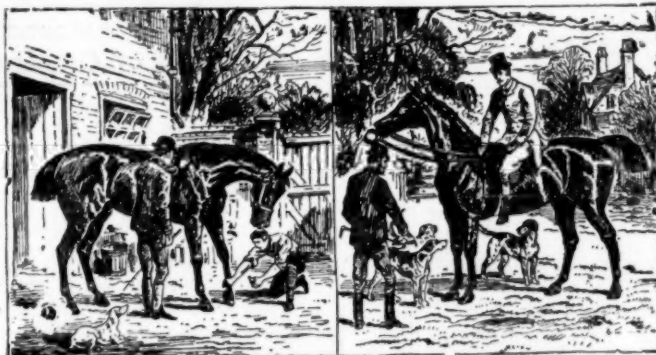
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Every information relative to the progress of lode-tin mining in the Wild River district (termed by geologists "The Cornwall of Australia") can be obtained by communicating with the undersigned. CHARLES JENKIN.  
"Herberton Advertiser" Office, Herberton, September, 1892.

Gold Medal, International Exhibition, Paris, 1889.

Gold Medal, Exhibition of Mining & Metallurgy, London, 1890.

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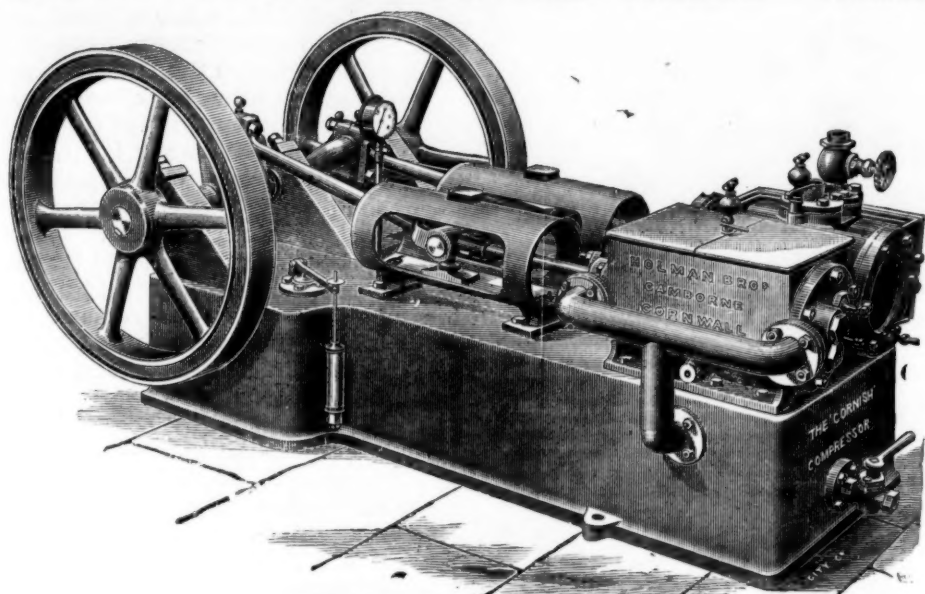
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At Wheal Grenville Mine, Camborne, Cornwall, **SIX MEN** with **TWO** new Patent **CORNISH ROCK DRILLS** started from the **150 FATHOMS** level and put up in **EIGHT MONTHS** a **11 FEET** by **5 FEET PERPENDICULAR RISE 46 FATHOMS 5 FEET 6 INCHES**, and about midway drove **1 FATHOM 5 FT.** No communication of any kind was effected until holing to the Shaft brought down from surface.

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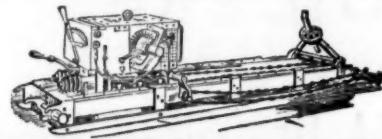
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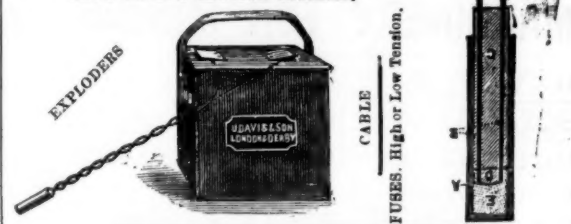
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Sec. B. ELECTRICAL PLANTS AND FITTINGS.

GOLD MEDAL, LONDON, 1892.

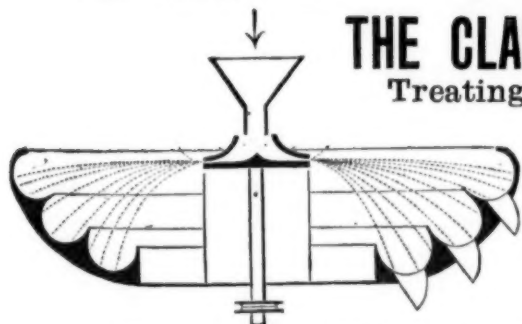
GOLD MEDAL, MELBOURNE, 1881.



IRON and STEEL TUBES (lap or butt welded) and FITTINGS for Gas, Steam, Water, Hydraulic, Compressed Air, and Heating Purposes, Black or Galvanized in stock to 8 inches diameter. Boiler and Steam Tubes, Water Mains, Well Tubes, Pipe Lines, Telegraph Poles, Heating Coils, &c.  
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Homogeneous substances, such as Emery, Glass, Sand, Sulphur, Black Lead, &c., graded according to size in one operation.

Terms for Experimental Concentration, and for Supply of Machines on Application.

## NEW PATENTS.

LIST of APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs. Rayner and Company, Patent Agents, 37, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

- 7994 William Farley, 2, East Parade, Leeds.—Improvements in or in connection with cranes.—April 23.
- 7991 Robert B. Davidson and Barry, Henry and Co. (Limited), 95, Buchanan Street, Glasgow.—Improvements in and relating to wrought iron and steel pulleys.—April 23.
- 7989 Wilhelm Trantmann, 10, Friedrichstrasse, Berlin.—Lubricator.—April 23.
- 8001 John Black Davis, 52, Chancery Lane, London.—Method of promoting combustion in furnaces.—April 23.
- 8018 Theodore Kohle, 16, Buckingham Street, Strand, London.—Improvements relating to lubricators.—April 23.
- 8023 Augustin Beaudry, 6, Lord-street, Liverpool.—Improvements in power hammers.—April 23.
- 8028 Arthur Morris, 4, South Street, Finsbury, London.—Improvements in miners' lamps.—April 23.
- 8041 Samuel Henry Adams, Peasholme Green, York.—Improvements in exploding chambers and apparatus for oil gas or similar engine, motors, or pumps.—April 24.
- 8083 Benjamin Stern, 17, 84, Ann's Street, Manchester.—Improvements in powder blowers, blowers, and similar instruments.—April 24.
- 8094 John Edward Groaty, 52, Barry Road, East Dulwich, London.—Improvements in and relating to steam generators.—April 24.
- 8097 John R. Powell, 322, High Holborn, London.—Improvements in miners' squibs.—April 24.
- 8120 William Alfred Pearn, 5, Market Street, Manchester.—Improvements in machines or tools for drilling and other purposes.—April 24.
- 8145 Fred. Arthur Ives, 52, Chancery Lane, London.—An improvement in metallic packing.—April 24.
- 8157 George Timmis, 70, High Street, Southampton.—Improvements in and relating to rings for steam engine pistons.—April 24.
- 8186 James Edgar Green, 19, Chancery Lane, London.—An improved steam generator.—April 25.
- 8188 William James Baker, Peasholme House, Scarborough.—An improved automatic exhaust ventilator.—April 25.
- 8170 Frederick John Rowan, 37, St. Vincent Street, Glasgow.—Improvements in water tube steam boilers.—April 25.
- 8191 William Martin, 22, Glasshouse Street, Regent Street, London.—A new or improved spring motor.—April 25.
- 8248 John Dymond, 20, Landseer, Crediton.—Driving pulley.—April 26.

## SPECIFICATIONS PUBLISHED.

8106 Carey, hydraulic lift machinery, 1893; 10,347, Gessner, steam, &c., engine and pumps, 1893; 10,671, Bradley, lubricator, 1893; 10,945, McDiarmid, metal bands for forming tubes, &c., 1893; 11,502, Kikkin, explosives, 1893; 12,327, Banks, fireproof structures, 1893; 12,816, Labatt, elevator attachments, 1893; 1735, Johnson, furnace fire grates, 1894.  
The above specifications published may be had of Messrs. Rayner and Company, 37, Chancery Lane, London, at 1d. each including postage.

## OUR INQUIRY COLUMN.

TO CORRESPONDENTS.

Correspondents will please take note that all communications will in future be answered in this column and not through the medium of the post. All questions and replies should be accompanied by the name and address of the writer.

## REPLIES.

- R. J. M.—We consider the property looks encouraging at the present time.
- INQUIRER.—The meeting was held last Wednesday.
- E. F.—It would be better, we think, to wait a little longer and see if the returns keep up and improve; also watch the market and see what construction it puts upon the prospects.
- H. Y. B.—It is too early yet. The first two might be held.
- W. D.—We agree that it is a coming industry. Of course, it is as yet only in its infancy, but already it has displayed evidence of great vitality.
- F. A.—We believe they intend to sink to the 275, where they expect to meet the lode coming in from the adjoining property.
- BALLOONIST.—The anode is the positive terminal in a broken metallic or true conducting circuit; the terminal connected to the carbon plate of a galvanic battery or its equivalent in case of any other generator.
- C. J. R.—You have not sent your name and address.
- H. E. B.—Nearly every buyer of best selected copper in England stipulates for a certain brand or brands; but, if best selected is sold without naming brands, there is an implied guarantee that it will answer the "Birmingham test," i.e. a specially made ingot, composed of 68 parts of the copper and 32 parts of zinc, will roll out to 45 inches without break or fracture. Best selected quality has nothing whatever to do with conductivity, copper for that purpose being quite a different thing. As to the standard of conductivity, any electrical paper will give you particulars. Of course it is quite impossible to give a list of B. S. brands, and still more so in order of their quality. As regards conductivity, the matter seems to be a somewhat obscure one, but if it is of any assistance to you, we may say that the British standard is that of Mathiessen, and that, in a comparative table before us, 100 per cent. conductivity by this scale is given as the equivalent of 59.05 according to the usual German method of reckoning. Further, the German scale is drawn up by way of comparison with the conductivity of quicksilver.

## CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

\* \* We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract prices should be given.

The date given is that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such the name of "The Mining Journal" should be mentioned as the original source of the information, concerning which further particulars are required.

## HOME CONTRACTS.

Pipes, May 12 (Rugley).—For the supply and delivery of cast-iron pipes varying in size from 2 inches to 7 inches, also special castings, &c., required for the new waterworks, for the Rugby Local Board. Bills of quantities to be obtained of Mr. W. H. Radford, C.E., Angel Row, Nottingham.

Pipes, May 15 (Dewsbury).—For the supply of about 258 tons of cast-iron pipes from 9 inches to 36 inches in diameter, including irregulars, for the Dewsbury and Heckmondwike Waterworks. Drawings to be seen and specifications obtained on application to Mr. G. H. Hill, C.E., 3, Victoria Street, Westminster, and Albert Chambers, Albert Square, Manchester.

Railway Construction, May 15 (Ellon, Aberdeen).—For the construction of the Grunden Railway in Aberdeenshire, commencing at the Ellon Station on the company's Buchanan line, and terminating at Boddian, which will be nearly 15½ miles in length for the Great North of Scotland Railway Company. An assistant engineer will be at Ellon Station at 10 a.m. on May 1, to accompany intending contractors over the ground. Plans, sections, and specifications to be seen on and after 24th inst. at the office of Mr. Patrick M. Barnett, C.E., Waterloo Station, Aberdeen.

Rails, May 16 (London, E.C.).—For the supply and delivery of steel double-headed rails, steel bull-headed rails, and steel flat-footed rails, delivered at a port in this country, and (or) at Calcutta, and for engine turntables, for the East Indian Railway Company, as per specifications and drawings to be seen at the company's offices. Tenders to be sent to Mr. A. F. Dunstan, secretary, Nicholas Lane, London, E.C.

Dock Works, May 21 (Belfast).—The Belfast Harbour Commissioners have extended the time during which tenders may be lodged for the construction of the extension of the branch dock at the south end of Spencer Dock into Princes Dock.

Fencing, May 23 (Birkenhead).—For supplying and fixing about 662 lineal yards of wrought-iron unclimbable fencing, together with gates, &c., at the Gifford Estate, for the Corporation. Plans and specification may be seen, and forms of tender obtained at the office of Mr. Charles Brownridge, A.M.I.C.E., borough engineer and surveyor, Town Hall.

## FOREIGN CONTRACTS.

Railway Works, May 15 (Cairo).—For the earthwork, masonry, pitching, buildings, and other works, necessary for the construction of several lines of railway. Conditions and description of work to be seen during office hours, on application to Colonel Western, Broadway Chambers, Westminster.



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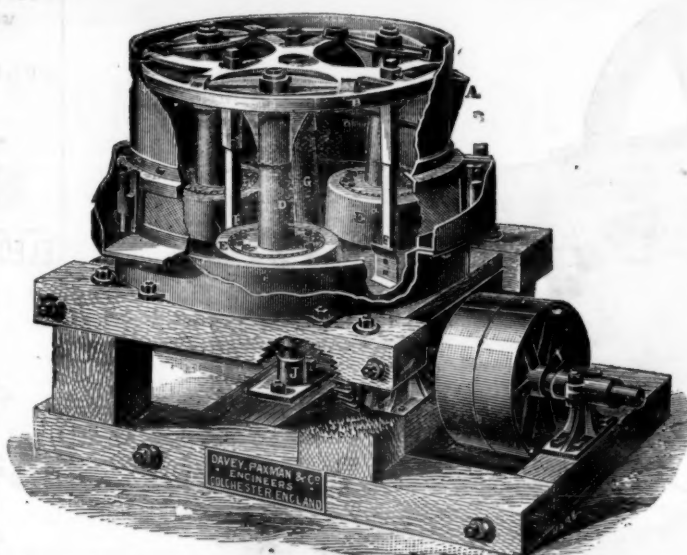
Telegraphic Address:

**"PAXMAN, COLCHESTER."**

Huntington's Patent Centrifugal Roller Quartz Mill for fine pulverizing in Concentration.

LONDON OFFICE

78 [late 139], QUEEN VICTORIA STREET.



D. P. & Co., after a great number of careful experiments have so improved and perfected the Huntington Mill that it must now be classed among the greatest inventions of the age. The excellence of its work is undoubted, and its superiority over Stamp Mills will soon cause a revolution in its favour for Quartz Crushing. Its first cost, and cost for freight and transit is much less than for stamps, it absorbs about half the power for the same output, and is continually crushing. It can be fixed and started in 12 hours, requiring for foundations only two pieces of timber 12 in. by 12 in. by 14 feet long, is more reliable than stamps, and has perfect delivery. It is used to its greatest advantage on gold quartz, for, because of its excellent amalgamating properties, it catches about 75 per cent. of the gold put into it.

Full Particulars on Application to  
**DAVEY, PAXMAN & Co.,**  
Colchester.

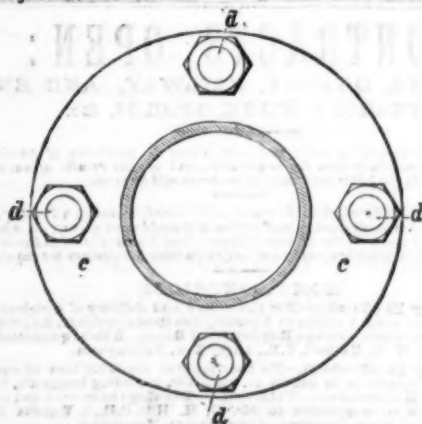
## MECHANICAL ENGINEERING: MACHINERY, MINING and RAILWAY PLANT, &c.

Illustrated Descriptions of New and Standard Mechanical Appliances, Accessories and Processes, adapted to Mining, Metallurgical, Railway, Engineering and other Industrial Purposes.

### "DOUBLY SECURE" TUBE JOINT.

THIS invention, which is patented in England and the principal foreign countries, has been specially designed by Mr. Joseph Aird for use in connection with his renowned "lap-welded wrought iron and steel tubes," and it is applicable alike for steam, gas, water, hydraulic, compressed air, and other pipes. The joint, which is perfectly unique in its simplicity and efficiency, is constructed as follows:—The two lengths of tube to be connected are formed with flanges *a* thereon, which are grooved to receive a ring of asbestos or other packing *b*, and upon these tubes are placed two loose clamping collars *c*, which bear against the flanges *a*, and by means of bolts and nuts *d*, are caused to force the ends of the tubes together, compressing the packing *b* between them.

Upon one of the loose collars *c* is a flange of *c*, which covers the joint and renders the blowing out of the packing *b* impossible, and upon the other loose collar *c* is a flange *c* which overlaps and supports the flange *c*. From the foregoing explanation it will be seen that the joint is most simple and practical, little or no fitting being required in its manufacture, and inasmuch as it requires no screw threads upon the collars or pipes, it can be put together and taken apart quicker than any known joint.



The joint will withstand any pressure up to 5 tons to the square inch, and it is, therefore, applicable for all purposes, and by reason of the peculiar overlap of the loose collars, it is evident that it is in effect what the patentee claims for it—namely, "Doubly Secure." This simple but important invention has not been long making itself known and appreciated, and the works of the patentee, we understand, are now busily engaged in the execution of a number of important British and foreign orders. Price and further information may be obtained direct from the patentee:—Joseph Aird, Wellington Tube Works, Great Bridge, Staffordshire.

**ZINC EXTRACTION.**—Zinc is being extracted in Sweden by a new electrolytic process in connection with which, *Invention bears*, some very telling and satisfactory tests have been undertaken. The zinc extracted in this manner is said to be equal to the best zinc in the market. The most important feature claimed for the new process is that it can be applied to zinc ore of very poor quality (for instance, the sulphur ore found at Falun), such as the Vieille Montagne Company have not thought it worth their while to exploit. Although the imports of zinc into Sweden are of some importance, it is stated that pure metallic zinc has not been produced in that country during the last 20 or 30 years.

## SOCIETY OF ENGINEERS.

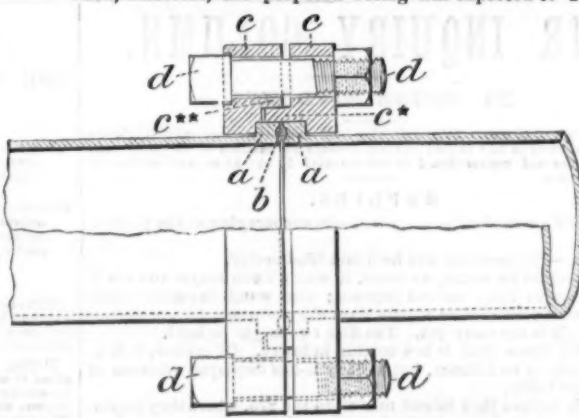
Mr. R. Nelson Boyd, on a Deep Boring, near Freistadt, Austria, by the Canadian System.

AT a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. George A. Goodwin, President, in the chair, a paper was read on the above subject.

Before entering on a detailed description of the boring operations under consideration, the author described the early methods of boring for minerals. He then explained the different systems of boring adopted, commencing with the early improvements introduced in Germany, alluding especially to the "free-fall" as compared with the "jars" as used to produce the effect of the cutting tool in the bore hole.

The author then described more minutely the American rope system, and the Canadian, in which ash poles or rods are used. The tools were explained, and the construction and working of the so-called rig fully illustrated. After a somewhat detailed description of the machinery adopted at the deep boring, the author proceeded to state that this work was undertaken for the purpose of proving an unknown portion of the Ostrau-Karwin coal fields in Austria, which is a continuation of the Prussian Silesian coal field. This part of the coal field is covered by a tertiary deposit of clay, which the local geologists assimilate to the Vienna basin, and which varies in thickness from a few feet to several hundred yards. The object of the bore hole was to penetrate through this deposit of clay, and discover the coal measures.

A bore-hole had already been put down in the neighbourhood, to a depth of 710 feet into the clay without passing through it, and, therefore, the proposed boring was expected to be one of



considerable depth. The diamond drill was first selected, but could not be applied owing to an insufficiency of water, and eventually the Canadian rig was adopted. The author then proceeded to describe the process of boring, the difficulties which had to be overcome, and the manner of lining the bore-hole. In the course of the sinking, a spring of water, charged with bromide and iodide salts, was cut at a depth of 1010 feet. Inflammable gas was first observed at a depth of 960 feet, and when the boring was not going on, the noise of the bubbling gas in the bore-hole was like the boiling of a gigantic chaldron.

The boring was continued down to a depth of 2011 feet 6 inches without passing through the clay deposit. It was accomplished in one year five months and five days. The actual drilling averaged 10 feet 6 inches in 24 hours work.

In conclusion, the author observed that, taking one consideration with another, the Canadian system has many advantages. In drilling through highly inclined measures it is preferable to the rope system, and by the use of the jars a much greater rapidity of drilling is attained than with the free-fall method. Lastly, in soft ground, it is possible to obtain an approximate section, which could not be secured by the diamond drill.

## ALUMINIUM AND ITS ALLOYS.

### LECTURE AT THE BALLOON SOCIETY.

AT the weekly meeting of the Balloon Society of Great Britain, at 9, Conduit-street, Regent-street, on the 8th inst., Mr. HENRY LEIGHTON (Van Wart, Leighton and Co.) read a paper on Aluminium and its Alloys.

A few years ago it was a popular idea that aluminium was a golden coloured metal, that looked very nice when made into pencil cases and watch chains. Its marvellous lightness and strength, and the difficulty of dealing with it, excited curiosity, apart from the fact that it was not found as ordinary minerals are; but was, so to speak, extracted from clay in the form of a gray powder, which was done by Wohler in 1829, though it was not really produced in a state of purity until 1854, and in 1857 the first aluminium works in England were started at Battersea, but did not prove successful.

The first article made was a baby's rattle for the young Prince Imperial.

It is, perhaps, the most widely distributed of metals, though not found in a metallic state. Many precious stones, such as rubies, garnets, sapphires, turquoise, and topaz contain it; but its reduction and production are so difficult, that the price has prevented its becoming almost as plentiful as iron.

It is produced from bauxite and cryolite. The former from near Baux, in France; and the latter, in important quantities, from the West Coast of Greenland. Both are called clays, in colour from snow white to reddish brown, according to the amount of iron or other impurities. Various works and foundries have been erected for producing the metal for commercial use.

Its weight is, relatively, one-third that of iron, quarter that of silver, and one-eighth that of gold. A gun metal casting on the table weighed 53 lbs., whilst the same casting in aluminium weighed only 16 lbs. Its melting point is about 700 degrees C., and its tensile strength 30,000 lbs. per square inch. It is very malleable, and can be rolled as easily as gold or silver. It is a good conductor of heat and electricity, and air neither wet or dry has any effect on it.

Sulphur does not change its colour, and it is proof against dilute sulphuric and nitric acids and strong vinegar. Aluminium does not readily lend itself to soldering, which is much against its making the headway its other excellent qualities entitles it to.

Pure aluminium is too soft to stand much wear, and is too weak to support much strain; but it unites with other metals, and it is in this alloyed state that its great value lies. Small percentages up to 10 per cent. of silver, nickel, copper, tin, &c., make it harder, stronger, and better wearing, without affecting its beautiful colour or brightness.

The power of aluminium bronzes to resist oxidation exceeds that of all similar metals. Ordinary acids have little effect, nor has ammonia or sea water, which should commend these bronzes to shipbuilders, sanitary, and other engineers, in all cases where steel is unsuitable.

There are many similar considerations, which must lead gradually to its superseding all other metals for these and many purposes.

The following resolution was passed:—"This meeting is of opinion that in view of the recent improvements effected in the production of aluminium, as set forth by Mr. Leighton, it is desirable that the Government should investigate and adopt this metal for military, naval, or other purposes whenever lightness, strength, and non-oxidation are of primary importance."

**THE ANTWERP EXHIBITION.**—The Antwerp International Exhibition was opened on Saturday by the King of the Belgians, who drove in State to the exhibition. After an address from the Comte de Pret, Member of the Senate and Chairman of the Committee, the King made a brief speech in reply. When the exhibition had been declared open His Majesty was conducted through the different galleries. There is much that is still unfinished, but one of the most interesting features is the annexe set apart for the Congo State. All that is possible has been done to present a realistic picture of African life. The entrance to the annexe is through rocky defiles, which lead to a wide open space planted with palms, cocoanut trees, and all kinds of tropical shrubs, in the midst of which are native huts, where negro families imported from the Dark Continent lead their ordinary lives.



## MINING ENGINEERS.

BY E. HENRY DAVIES, M.E., F.G.S.,  
Author of "Machinery for Metalliferous Mines"

IN our recent article on the subject of "Vendors" (*Mining Journal*, March 3rd), we pointed out some of the difficulties surrounding the sale of a mine, and made a few suggestions which we trust will be taken in good part by those desirous of bringing their properties to the notice of the British public.

At the same time we cautioned investors against rashly entering into undertakings which would not bear careful examination by qualified experts, and pointed out that the person most capable of advising on these matters was the mining engineer.

In our present article we desire to accord all honour to those gentlemen who have spent their lives in acquiring a knowledge of the science and art of mining, and who conscientiously do their utmost in the interests of their clients. We also desire to do what lies in our power to eliminate from the ranks of the profession that motley array of tinkers, tailors, soldiers, sailors, and others who think that by the mere addition of the letters M.E. after their names, they have established their claim to the title, and have acquired by that simple process all the knowledge and skill necessary for the conduct of the most delicate and intricate mining operations.

The profession of civil engineering has long ago been rescued from the hands of unlicensed intruders, and while allowing for the existence of black sheep in every flock, we must regretfully admit that as yet the letters C.E. carry more weight, and are, in themselves, a more trustworthy certificate than those of M.E.

The newly-formed Institute of Mining Engineers will, doubtless, in time acquire the authority and importance which its elder brother has already attained to. This, however, can only be done by the action of time, aided by the energies of its officials and members. In the meanwhile the profession must jealously guard itself from the intrusion of unqualified men, from whom in the past it has received immense damage and been brought into some disrepute.

The duties of a mining engineer have extended so greatly that it is well-nigh impossible for one man to combine them all in himself. Hence it is that young men joining the profession must decide, first of all, upon the particular branch they desire to follow. This decision is largely influenced by the birthplace of the student. If he hails from a colliery district he will in all probability take up coal mining, and find in that ample room for all his energies. If from Cornwall and parts of Wales, his attention will early be directed towards metalliferous mining, and on the studies necessary for obtaining an approach to perfection in that art, and the various processes of concentration connected with it, he will find ample scope for his talents. Then, again, we have men who take to stone or slate quarrying, or are devoted to ironstone mining. In short, each district turns out its own specialists who, having acquired a thorough knowledge of their own departments, can extend their experience by completing their education in other districts, and so in the course of years qualify themselves for the duties of consulting engineer.

Both at home and abroad there are many excellent mining schools which combine the theory with the practice of mining, but it is after the student has left his school or completed his apprenticeship that his sterner education commences. The responsibility of being in charge either of a small mine, or of a section of a big one, brings the young man quickly to his bearings. If he is not imbued with too great a sense of his own importance he will profit by all that goes on about him, and learn by constant observation what his book studies can never teach him—viz., the practical application of his theories and the command of men.

The lot of mining men may be cast in any quarter of the globe, and amongst people ignorant of the manifold advantages of English ways and the English language. He should, therefore, at an early date of his career, commence the study of at least one foreign language, and on the principle that a live dog is better than a dead lion, he can afford to give up Latin and Greek in favour of French, Spanish, or German. The preference should possibly be given to Spanish, and next to that to French. With regard to the acquiring of a foreign language, there is no doubt that it is easier to do so in the country itself and amongst its own surroundings, but it is utterly fallacious to suppose that any language can be learnt "in no time on the spot," and without a good deal of anxious work and constant application.

We do not wish to intimate that a mining engineer should be a Jack-of-all-Trades, but as matter of fact he must have more than a bowing acquaintance with chemistry, electricity, assaying, geology, mineralogy, surveying, mechanical engineering, book-keeping, and photography, in addition to his mining knowledge. Often in out-of-the-way places he will have to work without the aid of exact instruments, tools, or appliances, and the fertility of his imagination will be called upon to devise rough and ready make-shifts. The nearer, therefore, he approaches to being an all-round man the greater will be his value to his employers, and the greater his confidence in himself.

This self-confidence is an all-important quality to a man who is, perhaps, a solitary Englishman in charge of a motley crew of workers, away, say, in the interior of Brazil or Bolivia. At first he is entrusted with the expenditure of large sums of money, both for developments and machinery, and afterwards if all goes well he will in the course of duty be responsible for the remittance of bullion or valuable ore to his employers. Obviously a dishonest man, whatever his qualifications as an engineer, could not be entrusted with such a post, and this point is often lost sight of by board's of directors, who squeeze down their engineers' salary to the lowest point, and then expose him to the powerful temptation of appropriating some of the wealth which passes through his hands. Such a proceeding puts a premium upon dishonesty, and places an important official in a false position. The labourer is surely worthy of his hire, and taking into consideration the time and money spent upon the education of a mining engineer, the important duties entrusted to him and the future at stake, we are decidedly of the opinion that something more than a living wage should be offered to the man into whose hands the well being of the company is confided.

The subject of the accuracy and truthfulness of the reports made by mining engineers is a delicate one to deal with. We certainly cannot endorse the report current at one time on the Stock Exchange, to the effect that there were three categories of liars of which the positive and comparative were reserved for those whose capacity in this direction was limited, but that the superlative was exclusively occupied by men connected with mining.

As a general rule we may take it as a fact that the bulk of mining engineers will give an unbiased opinion, accurate and trustworthy to the extent of their knowledge and experience. If these latter qualities are limited, then, of course, the report is liable to be misleading. But here again we are met with the question of cost, and we must maintain that it is far wiser to give a good fee to a first-rate man, whose judgment can be relied upon, than from motives of false economy to employ a second-rate engineer, and run the consequent risks. There is no doubt but that in the past the reports of some men have been

influenced by the amount of fee offered; in other words, that their opinion has been bought.

The payment of fees is usually made, one half on leaving home and the other half on the delivery of the report. In some cases an endeavour is made to give shares instead of a portion of the cash—that is to say, to make the remuneration dependent upon the success of the undertaking. In the case of vendors and promoters, such an arrangement is fair, as we have pointed out in former articles, but in that of an engineer it is decidedly open to question. His unbiased opinion is the one professedly sought after, and is the main object of his examination. He is supposed to have no interest whatever in the past or future career of the mine; in short, to be absolutely independent. We fail to see, however, how he can occupy this position if his honorarium is paid in shares, whose value will be influenced by the opinion he himself will express as to the business.

The above applies to the consulting engineer only, for when a mining engineer occupies a permanent post as manager, it is advisable that he should have a direct pecuniary interest in the success of his management, and not only he, but also the principal foreman under him. This can be arranged by setting aside a portion of the yearly profits for distribution amongst the staff at the mine in a certain ratio according to their relative positions. The sum receivable by each should, however, be large enough to be worth having, so as to give them a substantial interest in the concern, and induce them to use all their energies towards economical working and satisfactory results.

The mining engineer sent out to report upon mines in regions far away from civilisation runs into dangers which would fill volumes of books of travel. He, however, has to take them as part and parcel of his profession, and can be excused sometimes if over a quiet pipe he forgets the professional point of view, and relates adventures which sound stranger than even the fiction of the novelist.

The knowledge that upon the opinion of this stranger who has come amongst them will depend the sale of their concession and the introduction of cash into a poverty-stricken district, is an inducement to the natives to endeavour to influence that report in a favourable sense, while their attempts to get at the private opinion of the expert are worthy of a better cause. The latter, indeed, is placed in an awkward predicament. His employers alone are entitled to his opinion, but the residents on the spot, who not uncommonly welcome their visitor with great hospitality consider themselves also entitled to what may be termed a special advance edition of the report. Diplomacy must now be called into play. There are many and valid reasons for concealing a favourable opinion, and there are others equally valid against the blunt avowal of an unfavourable one, which might, indeed, end in the, of course, purely accidental tumble of the expert over a precipice, or in some other act of violence at his expense. Nor can he trust the ordinary means of communication with the outside world, as the underpaid officials of young and unsettled countries cannot withstand the temptation of a bribe, so that the expert had better keep his own counsel until he is well clear of the neighbourhood.

The result of the establishment of mining schools and of the regular training of men to the profession has already produced favourable results, but we still have sometimes occasion to feel ashamed when comparing the reports of our own experts and mine captains of the old school with those of German mining engineers. We ought to make it a point of national honour to be in the front rank as miners, and it is only by means of a regular course of scientific combined with practical training, that the young men of to-day can hope to develop into and hold their own with the mining engineers of the future.

## THE BENNETT AMALGAMATOR.

By Mr. BRENTON SYMONS, M.I.C.E., M.E.

(Concluded from page 479.)

BUT though this and similar machines must be considered excellent for pioneers, and for the less ambitious class of prospectors, it wants something far higher in the mechanical scale to cope successfully with the vast tracts of country which recent explorations have proved to enclose gold in quantities that would yield great profits when treated on a larger scale, and with machinery capable of eliminating the precious metal without the aid of water. The monitor, by which such immense masses of strata were degraded in the early days of placer mining, was at best a defective instrument, because it failed totally to arrest the fine gold in spite of flames miles in length, on account of the absolute necessity of maintaining an uninterrupted flow of water and debris; thus, only the coarse grains were arrested, which Professor Silliman estimated to be less than a quarter of the actual amount, most of which still remains mingled with the debris lying in the valleys below. Any machine which can extract this gold and the auriferous wealth of unworked placers without demanding large supplies of water, and avoiding the inundation of cultivated lands, must without doubt have a vast horizon and a splendid future. Such a machine Mr. Erastus T. Bennett, of Colorado, appears to have invented, after years of anxiety and costly experiment, and he claims to have solved the question of the scientific extraction of gold from placer deposits, since not only will his apparatus separate the visible gold, but also that far larger portion not apparent to the eye, which is universally believed to amount to more than half, and by some authorities is placed as high as three-fourths of the total gold enclosed.

It is not easy without diagrams to describe intelligibly a large complicated machine that does the work of hauling, concentrating, amalgamating, and dumping simultaneously; the machinery comprises a boom with dipper, sizing cylinders, amalgamating tanks, a conveyor for dumping gravel, and a pump for tailings discharges, together with the engines to operate the various mechanical appliances. The steel platform, upon which all this machinery has been erected, is 39 feet long by 11 feet wide, and rests on railway wagon wheels having a gauge of 6 feet, which permit automatic advance as the bedrock is exposed, making a cut through the gravel of not less than 50 feet wide. "Upon the frame is a circular house or cab, in the centre of which is a steel mast supporting the boom, from which the dipper is operated. This cab, with the boom and dipper, revolves upon a turntable. In it the operator, by means of three switches, controls the boom, dipper, and turntable. The three motors furnishing power to operate the turntable, dipper-handle, and dipper, each of 15-horse power, are placed the first two in the cab, and the third on the boom. Behind the cab another house is placed within which are the motors for propelling the machine, and for operating the conveyor, cylinder, tailing wheel, tailing pump and agitators.

"Behind the cab is the amalgamating tank, in which the cylinder revolves to a depth of 3 feet. Attached to the frame on the right of the cylinder is a hopper into which the dipper automatically empties, and on the left the conveyor, which serves to carry away the coarse tailings. The action of the conveyor—an endless line of buckets—in removing the coarse tailings needs no explanation. Its length may be indefinitely in-

creased as the height of the gravel bank may require. The cylinder, 105 inches in diameter by 96 inches in length, is composed of an inner and outer cylinder. The inner one, which is 89 inches in diameter, is made of three-eighths perforated steel plates. These plates joined spirally with raised edges form an archimedean screw with six revolutions in the length of the cylinder, the threads or flanges being raised 4 inches, so that large stones and boulders ride upon the edges. The outer cylinder is formed of triangular wires, set one-twelfth of an inch apart. It is furnished with a cylindrical steel brush to work between the wires and prevent clogging, an archimedean screw and 175 steel fingers, curved in the direction in which the cylinder travels, which keep the gravel continually in motion. The opening on the tailing side allows the passage of a boulder 28 inches in diameter, although no stone so large is allowed to pass as a grille is placed above the bottom of the dipper to retain all boulders more than 18 inches in diameter. These on the return of the dipper to the bank are automatically thrown out.

"The amalgamating tank is in the form of a W, 20 feet in length at the bottom, 11 feet wide across the top, and 54 inches in depth, fitted with steel covers secured by padlocks. In front, on both sides, and in the centre behind the cylinders, it is lined with corrugated copper plates, heavily silvered on both sides. The area of all the plates is more than 900 square feet; a ton of copper is used in making, and 2500 ounces of silver in plating them. A cross section of the tank would show that at each of the two lower points of the W there is a 'valley,' into which the water is introduced. Each valley, 18 inches in width, is covered by a water-tight  $\frac{1}{2}$ -inch steel plate, into which are screwed for the entire length of the tank, about 6 inches apart, water jets, which are about  $\frac{1}{4}$  inches in height from the surface of the plate, and are arranged to point backwards and alternately to the right and left. On each side of and below these jets is a rod running the full length of the tank, to which is attached an equal length of coarse wire cloth. These rods, called agitators, are moved backwards and forwards by means of eccentrics, which give them a panning motion, the object being to keep the pulp under treatment from settling, and to permit any loose amalgam to make its way by gravitation to the lower (forward) end.

"The cylinder revolving at ten revolutions per minute receives the material from the hopper, and not only screens, but in its passage through, which occupies about a minute and a half, scours it as effectually as if the work were done by a wet sand blast, which is practically the action which it undergoes. This scouring removes from the gold any coating which might prevent or retard its amalgamation, and separates it from adhering particles of clay or other matter. The coarse gravel is also so thoroughly washed that none of the finer particles can be found adhering to it, even though the gravel be cemented. From spaces between the wires the fine gravel or pulp thus prepared for amalgamation passes into the tank, where it is at once taken up by the current of water from the jet over which it falls. The column of water from this jet throws the material upward and backward spirally towards the surface of the tank, right and left alternately, creates a downward current along the side which draws the pulp over the plates, compelling each particle of it into contact with the quicksilver with which they are charged. The pulp descending is received upon the column of water from the next jet to the rear, which repeats the operation, and so on to the end of the tank. Mr. Bennett claims that each particle of gold must come in contact with the plates 400 times. A close examination of the plates for the last 4 or 5 feet shows hardly any gold.

"Behind the tank is the tailing wheel, fitted with buckets, which passes the fine tailings delivered to it through an opening on each side of the end wall of the amalgamating tank into a waste sluice. The water is then drained back into the reservoir. A centrifugal pump is placed in the waste sluice behind the tailing wheel which throws the fine tailing and water over the first ridge of coarse tailings upon the cleaned up bedrock of previous cuts, when the water is drained off into a reservoir to be re-used."

The nominal capacity of the Bennett Amalgamator, which is operated entirely by electricity, and weighs 100 tons, is 3600 cubic yards a day. When at work the dipper makes from 90 to 100 loads per hour, each load nominally  $1\frac{1}{2}$  yards, but it is, however, not full every time. The inventor guarantees a minimum of 3000 yards, or about 5000 tons in 24 hours. To work this machine five men are needed—an engineer, two engine drivers, and two labourers—which with three shifts and a manager would be a personnel of 15. With fuel (5 tons of coal), and stores it is found that the expense of working is about \$100 per day, which would place the cost of running through a ton of gravel at 2 cents.

The Bennett machine is washing gravel in Colorado which contains only 2 cents worth of visible gold per cubic yard, but it is actually extracting 20 cents, the flour gold being all saved, and this is being done at a cost of 2½ cents. If, as claimed by placer experts, the gold panned out from gravel represents only a tithe of its absolute value, the amalgamator is capable of passing through any gravel in which a colour of gold could be found at a profit that would satisfy the most avaricious investor. Even with pay-dirt at 5 cents a cubic yard, the annual profit would reach \$15,000, equal to 25 per cent on the cost of placing a machine which it is stated would not exceed \$60,000 at any point in the Americas.

The aggregate value of the placers still unworked in California has been fixed by Professor Proctor at 2000 millions, and a single grant of 30,000 acres in New Mexico has been carefully prospected, and estimated to enclose gold to the value of 400 millions. These figures are sufficiently startling when placed in conjunction with the fact that California produced but 230 millions from 1848 to the end of 1882. Indeed, the amount of auriferous gravels throughout the world is incalculable and practically inexhaustible. Placer mining has also the advantage of being a perfectly safe business, as the value of the gravels can be proved before purchasing, and the approximate profit of working them fixed.

The standard currency of the leading commercial nations being gold, the other metals have only comparative value, so that the super-appreciation of gold—especially in regard to silver—induces disturbance in financial economy. The stream of gold poured into the world's treasury for so many years from Australia and California enhanced the value of silver, and the converse—the over-production of silver—has led to renewed appreciation of gold. The remedy is transparent, and the application of it has been already initiated. Instead of mining for silver, let attention be directed to the production of gold by extensive prospecting and by the introduction of labour-saving processes of extraction. Possibly it may be reserved for the Bennett Amalgamator to reinstate the balance between the two precious metals. The world's stock of gold is vaguely spoken of as 1300 million pounds sterling, and as the yearly production is only £20,000,000, nearly the whole of which is absorbed by the arts and industries, the currency gains but slight accretions. Now, by a slight of fancy, supposing that 100 such machines as that above described were operating during ten years with gravel worth no more than a shilling a yard, £500,000,000, or more than a third of the existing amount, would be added to the currency. It must be admitted that such an addition would bring up silver to its face value.



## REVIEWS.

## MONOGRAPH ON THE IDRIA QUICKSILVER DEPOSITS.

*Geologisch-Bergmännische Karten mit Profilen von Idria nebst Bildern von den Quicksilver-Lagerstätten in Idria.* (Vienna, 1893.) Edited by Oberberggrath Wilhelm Göbl from notes by various Government mining officials. Published by command of His Excellency Julius Grafen Falkenhayn, Minister for Agriculture.

The text of this monograph on the Idria quicksilver deposits is confined to 36 pages, but it is profusely illustrated by 61 coloured plates, 1-20th the natural size, showing the formation of the ore deposit, in which the vermilion of the cinnabar readily catches the eye; one geological map of the district drawn to a scale of 1-25,000ths; a mining geological chart, and three sections reduced to 1-50,000ths. With a work of this sort in the hand, one has the best substitute for actual observation. The illustrations bring vividly before one the state of affairs, and do away with much of the otherwise necessary verbosity in the explanation; in fact, with these sections of the drives as the work progresses before us, we can almost fancy ourselves making a personal inspection below ground without the disadvantage of the usual dirt. These illustrations are the more valuable, as placing on record features that are no more; and it is well that such work which cannot be repeated should bear the stamp of the Austrian Government upon it, for knowing the training a man must undergo before being qualified for technical Government employment, combined with the attention paid to small details by such officials, we may rest assured that such illustrations faithfully represent what they purport to be. The mining town of Idria is in the neighbourhood of Loitach, in Austria, and is 332-3 metres above the level of the Adriatic sea. The quicksilver deposits were discovered in 1490 or 1497, and in 1850 were taken over by the State, by whom they have since been worked. Idria ranks third among the great quicksilver producing districts of the world, being preceded by those of Almaden in Spain, and New Almaden, in California, U.S.A. Owing to the folding, faulting, and other disturbances, the ore bearing beds hardly ever show at the surface, being mostly overlain by barren rock. The same abnormal disposition of the rocks cause the Gailthaler strata of the carboniferous (Perm.) formation to form the hanging wall, the Seisser strata belonging to the Trias formation forming the footwall. The Skonzaschiefer, which is at most 20 feet thick, carries the richest cinnabar ore (steel-heptic and coral-ore), but it is not distributed through the whole of these states. The Skonzaschiefer is a member of the Wengen strata which belongs to the Upper Trias formation. The principal strike of the ore carrying trias beds runs N.W. 21h. to S.E. 9h., which corresponds with the general strike of the chief dislocation of the district. The ore occurs in pockets, threads, and lense-shaped masses between the layers of the slate and in the joints, also disseminated through the rock. The field is divided into two portions, the north west and the south east. In the north west the ore occurring in the Skonza slates takes the form of beds, while that occurring in the dolomite conglomerate and the dolomite breccia has the character of a stockwork. In the south east portion of the field the Skonzaschiefer either fails or is very small, the ore occurring chiefly in perpendicular veins which cut through the Guttenstein strata, and also passes into the dolomite of the hanging and foot walls. The receptacles for the ore were formed in the Eocene time, therefore the ore was deposited in Post-tertiary periods. Most authorities agree that the cinnabar was concentrated by solution. At the end is a good bibliography in connection with the local deposits.

## A USEFUL BOOK.

*Potts' Mining Register and Directory, for the Coal and Ironstone Trades of Great Britain and Ireland, 1894-5.* (North Shields: W. J. Potts, Atlas Works.) Sixth annual issue.

This valuable book is, as its merits deserve, becoming pretty well known, and is to be found in many offices where the information it contains is advantageous and indispensable. When the compilers of it undertook their task they furnished a *vide mecum* of which we were in need, and, as each number made its appearance, it seemed to convince us more and more of its usefulness. We have manuals giving us information respecting foreign mines, and it would be a reflection upon us if we did not possess one dealing with our home properties. Accompanying the enumeration of particulars respecting each coal field is a map which, of course, greatly adds to the value of the publication. Statistics are given of the iron ore and ironstone, under the "Metalliferous Mines Regulation Acts," arranged under the various counties of Great Britain and Ireland, which section is followed by a directory of managers of mines under the "Coal Mines Regulation Act." A statement then follows showing the age and experience required, and subjects for examination of candidates for first and second class certificates of competency in the respective inspecting districts. The book concludes with the contents and the text of the Coal Mines Regulation Act, 1889.

## TWO NEW MAPS.

We have received for review two maps, produced upon a very large scale, which will usefully fill a couple of blanks that have hitherto made themselves felt in our atlases. The scope of the first, published by Messrs. Waterlow, is sufficiently indicated by its ample title:—"Campion's Map of the Collieries, Iron, Tin, Copper, Chemical Works, and Railway Stations in South Wales." These various sorts of works are distinctively shown upon the map by differently coloured and shaped marks. Beyond this the chart conveys a good deal of information that will be gladly received by those to whom the map appeals—those, that is to say, who are interested in the industries of South Wales. The most acceptable of these additions is a general vertical section of the South Wales coal fields. The excellent appearance of this map, its clearness, comprehensiveness, and generally artistic "get-up," will speedily make it a favourite. The second map before us comes from Frankfurt, and is published by Carl Jügel Nachf (Moritz, Abendroth). It is a large scale production of Dr. H. Polakowsky's map of the Republic of Chili. The subject is one of more than ordinary difficulty, owing to the jagged contour of the coast, but the map is admirably executed—fit, indeed, to rank among the best issued. When the large number of mines and railways in Chili is remembered, a large demand for the map may confidently be expected.

## MINING IN TASMANIA.\*

By G. COLLINS L'VEY, C.M.G.

THE leading productive industry of Tasmania is mining; 16 years back there was little known, and less thought about it. In 1869 it was of such small importance that it was not even mentioned in the colonial statistics. In the following year an export of gold appeared—2131 ounces, valued at £7476. In 1887, the export of gold was 37,252 ounces; in 1888, 39,617 ounces; in 1889, 32,232 ounces; in 1890, 23,107 ounces; in 1891, 39,203 ounces; and in 1892, 45,110 ounces. In 20 years 673,543 ounces of gold have been exported, valued at £2,600,000. The second great industry is tin mining. In 1872, just 22 years ago, this metal was unknown to Tasmanian statistics; in 1873, 4 tons of tin ore were exported, valued at £220; from that period to the end of 1892, the exports of tin ore and smelted tin represented 60,281 tons, valued at £5,592,615; in 1891, the export was 3174 tons, valued at £290,797.

## The Principal Gold Mining Regions.

are contiguous to the east and west banks of the River Tamar about 35 miles from the town of Launceston; but alluvial gold, which does not always find place in the statistics, has for 12 or 14 years been continuously obtained in considerable quantities on the River Arthur and the west coast. The tin mining districts are widely scattered. The first important discovery was in 1879, at the renowned Mount Bischoff, on the north-west coast; this mine has paid nearly two millions of money to its shareholders, and has paid much more than a million in the shape of labour, although the original capital was only £30,000. The north-eastern and eastern deposits were next discovered, and opened out an enormous stretch of rich alluvial stanniferous country; and on the extreme west coast lodes of tin bearing ore have been opened by numerous companies, but, so far, without much practical result. Silver and bismuth have also been found; and the former, through the development of the Mount Zeehan and Mount Dundas fields, now promises to surpass in output both gold and tin. The total output of silver was valued, in 1888, at £5838; 1889, £7044; 1890, £26,487; 1891, £52,284; and 1892, £45,502. Total, £207,155. The coal fields are extensive, but are not worked to any very great extent, and the output averages about 50,000 tons per annum. The grand total of mineral production was, in 1892, £518,390.

## The Mineral Wealth of Tasmania

is, however, only partially developed; and although persons who invest in Tasmanian mines have to run the risk which necessarily attaches to mining in every part of the globe, there is, perhaps, no country in which the prospects are more satisfactory and encouraging than they are in the colony which I am now endeavouring to describe. The report of the Secretary of Mines, dated July 24th, 1893, contains the following important statement:—

"It is satisfactory to note that, notwithstanding the financial crisis through which the colony is passing, rendering it difficult to obtain money for the purchase of machinery or to employ labour for developing mining property, the mining industry of the country is not only holding its own, but during the year which has just closed has made a very substantial advance. The value of the output of minerals and metals has exceeded by £40,000 the output for the year 1891-2. Machinery to the value of £35,000 has been imported and erected, and progressive works, such as tramways, shafts, and tunnels, with other works of development, have been carried on with much vigour in various parts of the colony, but notably so on the west coast. In all quarters there is

## Evidence of Steady Improvement.

and there is every reason for believing that, at no distant date, there will be a large and important increase in the mineral export of the colony.

"The disastrous fall in the price of silver will no doubt have the effect of closing down some of our lower grade mines; but there will remain many mines rich in lead, which, with the improved and more economical method of working now prevailing, will still be worked at a substantial profit.

"Recent developments at Mount Lyell give promise of most important results. Dr. Ed. Peters, jun., M.D., M.E., an eminent metallurgist of the highest repute, has lately spent some months at the mine. In his report just issued he estimates the quantity of ore in sight at 4,500,000 tons. His figures for the average value of this ore per ton of 2,240 lbs. are—Copper, 4½ per cent.; silver, 3 ounces; gold, 2½ dwts. This ore, he asserts, can be worked at a net profit of £1 10s. 5d. per ton. Dr. Peters concludes his report with the words, 'I will only say, in conclusion, that in the past 20 years I have never seen a mining and metallurgical proposition that promises so certainly to be a great and enduring property as this.' If the practical result comes within measurable distance of what is here foreshadowed, the impetus given to trade throughout the colony by the successful working of this one mine alone will be immense."

## "Discoveries of Gold in Quartz

and alluvial have been made at Bell Mount, some 24 miles north-east of Sheffield, which bid fair to be of considerable value. Extensive deposits of tin have been found at Roy's Hill, Brookstead, and Ben Lomond, in good accessible country near Avoca, all of which are favourably reported upon by the Geological Surveyor. Other deposits have also been found at the Iris River, at North-East Dundas, and at Stanley River, on the West Coast; whilst the known deposits of wolfram near the Pieman Heads, and nickel at Hazlewood and near Dundas, are reported as valuable, and likely to be profitably worked. An extensive bed of canal coal has been discovered at Barn Bluff; it is stated to be of good quality, and great value, but its locality is in at present difficult country. Other discoveries of various minerals and of minor importance have also been made."

The people of Tasmania anticipate that the results from Mount Lyell will, at any rate, equal those from Mount Bischoff. All that is required is capital to develop the mine, and to construct a railway from the town of Strahan. The geological surveyor, Mr. Montgomery, has reported at length upon the mine, and from this document I make the following extract:—

"The property is situated on a ridge connecting Mount Owen with Mount Lyell, about 1000 feet above sea level, and distant by road about 30 miles from the port of Strahan. The road is fairly good, but narrow cart-road for 23 miles, as far as Lynchford, and from here onwards is a sledge-track very steep in places. The mine is situated on the eastern slope of the range, being at the head of one of the branches of the Linda Creek, an affluent of the King River. The lowest adit and the battery are about 180 feet below the saddle over which the road from Strahan comes in, and the top of the outcrop is about 230 feet above the adit. A route for a railway is now being surveyed from Strahan to the mine, and I understand that it is intended, if found practicable, to bring it over the saddle to the mine itself."

## A Large Mass of Pyrites

standing in close connection with the hematite, and as development proceeded, it has become evident that this pyrites really constitutes the main body of the deposit. Analysis having shown it to contain copper, gold, and silver, it was recognised at last that the treatment most suitable for the ore would be the process of smelting for copper by which all the contained valuable metals would be recovered."

That mining in Tasmania is, on the whole, profitable, is shown by the dividends, which in 1891-92 reached £144,195, and in 1892, £121,091.

\* Abstract from a paper read at a meeting of the Society of Arts.

## MEETINGS OF MINING COMPANIES.

## SANTA BARBARA GOLD MINING COMPANY, LIMITED.

## Result of the year's working unfavourable.

The annual general meeting of shareholders was held at the offices of the company, 21, Water-street, Liverpool, on April 30, Mr. E. S. HOLLAND presiding.

The SECRETARY (Mr. Moore) having read the notice convening the meeting, and the minutes of the previous general meeting, the report and statement of accounts were taken as read.

The report of the company's proceedings during the year ending 31st December, 1893, with the audited balance sheet and statement of accounts for the same period was as follows:—

The results of the year's working are, the directors regret to say, again unfavourable; the mine working account showing a loss of £465 1s. 8d. for the year. This result has been chiefly caused by the continued difficulty of procuring a sufficient force of workpeople for the mine, by a large rise in the rate of wages, and towards the latter part of the year by the short supply of explosives consequent upon the political disturbances in Brazil, which precluded the obtaining of a supply from Rio de Janeiro. The annual report of the manager, which is appended herewith, enters fully into the causes that have prevented better results being realised, notwithstanding the considerably improved appearance of the mine in the bottom level and the shaft as compared with some years previous. In view of this better appearance of the lode in depth, and of the fact that explosives can again be obtained from Rio de Janeiro, owing to the collapse last month (March) of the insurrection there, the directors hope that improved returns may be derived from the mine during the current year. The quantity of mineral treated at the stamping mills during the year, viz., 8563 tons, shows a decrease of 407 tons, as compared with the quantity stamped in the previous year. The average standard of the ore treated shows the very small decrease of '020 of an ounce per ton below that obtained in the year 1892, or practically the same yield; the figures for the respective years being 2-336 ounces and 2-316 ounces per ton. The quantity of mineral raised from the Pari Mine in the year 1893, amounted to 9997 tons, as compared with 11,115 tons brought to surface in 1892, or a decrease of 1413 tons. The stone rejected at the stamping mills from this 9997 tons amounted to 1434 tons, or a decrease of 1075 tons compared with quantity rejected in 1892, thus leaving 8563 tons of good mineral which were treated at the stamping mills, and yielded 24,114 ounces of retorted gold, or equivalent to an average of 2-316 ounces per ton of mineral stamped. The usual full details of the operations in the reduction department are given in the annual report of the reduction officer appended to this report. The following is a summary of the results of the company's operations during the past four years, given for the purpose of comparison.

Year.	Tons raised.	Tons stamped.	Produce, ounces.	Produce per ton, ounces.	Value of produce.	Expenses in Brazil and England, less interest, rents, &c., received.	Total profit from all sources.	Total loss.
1890	18,642	14,302	41,577	2-927	£17,912 18 9	£20,488 5 4	—	£2575 6 7
1891	15,159	12,650	38,302	3-178	16,565 17 5	15,805 15 6	£759 1 11	—
1892	11,410	8,970	25,448	2-936	11,124 12 8	12,759 17 5	—	£635 4 8
1893	9,997	8,563	24,114	2-816	10,544 19 6	12,508 2 10	—	£1963 3 4

† Including debenture interest.

The loss shown for the year 1893 on the mine working account is ... .. £465 1 8  
Adding to this sum the annual interest charge of the debentures, £800, and the interest on loans, &c., £393 5s. 3d., less 4s. received for transfer fees ... .. £1498 1 8

makes as the total loss for the year the sum of ... .. £1963 3 4

The annual report of Mr. Treloar and the table of statistics give the usual full details of the operations at Pari during the year. It is satisfactory to know that Mr. Treloar's apprehension of the stoppage of the works at the mine through lack of explosives has not been realised, and that the termination of the insurrection at Rio de Janeiro will now enable dynamite and other materials to be obtained as heretofore. Great credit is due to Mr. Treloar for the continuance of the operations at Pari during the past few months in the face of exceptional difficulties owing to the want of explosives and the political disturbances in Brazil. The directors would draw special attention to the reference in Mr. Treloar's report to the cutting of a new lode at Pari in August last. This lode, the outcrop of which appears near the entrance of the deep adit level, is parallel to that hitherto worked upon at Pari, and was cut into at a depth of 18 fathoms 2 feet from the top of the hill; the distance across the strata from lode to lode being 37 fathoms (74 yards). This new lode presents many of the characteristics of the old lode now being worked, but, through want of explosives, operations thereon were discontinued in September, hence but little has been seen of it as yet. The mine captain's and head mechanic's reports, giving the full details of the operations during the year in each of these departments, are appended to this report, and the plan and longitudinal section showing the mine workings during the year 1893 also accompany this report. From the report of the mine captain it will be seen that during the year the shaft had been sunk 7 fathoms 9½ feet, making its total depth below the deep adit 171 fathoms 5¼ feet. The lode in the shaft at the commencement of the year was small and poor, but it began to improve in the north end in February, and the improvement continued to the end of the year, the lode in the bottom then averaging 9 feet wide and showing strong lines or pyrites; its appearance being better than has been the case for some years. The No. 7 stopes south had been extended 4 fathoms 5¼ feet, the lode in the same being small and of ordinary quality. The Nos. 8 and 9 stopes had been extended 37 fathoms 1 foot and 8 fathoms 2 feet respectively. The lode in the No. 7 stopes had varied much in width and also in quality owing to the frequent appearance of sandstone and hornblende, while in the No. 9 stopes the lode had shown great improvement, having averaged from 7 to 3½ feet wide, yielding stone of fairly good quality throughout. In the No. 5 stopes north, the north end of the shaft had been stopped away for about 1 fathom in length for the whole depth sunk during the year in a lode averaging 8½ feet wide, and producing mineral of fair quality. As the company's debentures became due on the 1st January, 1894, the directors invited the holders to renew them for a period of two years, i.e., to the 1st January, 1896, and this has been agreed to and carried out. The financial position of the company precluding the due payment of interest during the past year, deferred interest warrants have been issued in respect thereof entitling the holders to payment as far as funds become available for the purpose. In the able manner in which Mr. Treloar has continued to conduct the operations at Pari again merits the recognition of the shareholders. In his exertions for the interests of the company Mr. Treloar has been well seconded by the staff generally. The directors retiring by rotation are Mr. William G. Holland, and Mr. Thomas Tregellas, who are eligible and offer themselves for re-election. The auditors, Messrs. Chalmers, Wade and Co. also retire, and their re-election is recommended to the shareholders.

The CHAIRMAN, in moving the adoption of the report and account, said that the directors regretted their having to report another year of depression and trial for the company. When they last met, 12 months since, they had likewise an unfavourable report to make regarding the previous year's working, but he at that time pointed out that the early part of the year 1893 was showing some improvement in the results at the mine, and the directors were consequently hoping at that time to have a more favourable year for 1893 than had been the case during 1892. For the first three or four months of 1893 they made some profit at the mine, which was fairly satisfactory, considering the shortness of the supply of labour and the ordinary quality of the lode, but in the month of May the lode deteriorated, and also during that month and the succeeding months of June and July. As they would observe from the table of statistics appended to the report, the yield of the ore fell off very materially, that for the month of June showing an average return of only slightly over 2 ounces per ton of stone stamped, which naturally left a considerable loss on the working. The working for the month of July was not quite so bad, the standard of the ore having gone up a little, but the poor returns of these three months had been the cause of what had at first looked like a profitable year on the mine working account having resulted in a loss of £465 1s. 8d. shown in the accounts. After July the lode gradually improved somewhat, and at the close of the year it was looking, according to Mr. Treloar's annual report, very much better, and in the deepest or No. 9 stopes and in the shaft it was better than had been the case for some years past. During the latter part of the year, when the lode was improving, they had the misfortune of finding themselves short of explosives at the mine, consequent upon the political disturbances in Brazil preventing the dispatch of their usual supply from Rio de Janeiro, and to this unfortunate circumstance the year's unfavourable results was also to some extent to be attributed. In addition to the loss of £465, there was also the charge for interest on the company's debentures and loans, nearly £1500 in all, and these together made up the adverse balance of



£1963 3s. 4d. for the year, but he would point out that the payment of the whole of this interest having been deferred, the company's pecuniary position had not been weakened, nor had any directors or managing directors' fees been paid (indeed, no fees had been taken by the directors for a long time past) a matter of another £500, hence, as a matter of fact, the company had not as yet been called upon to abstract anything from its funds towards the loss of the past year. The consideration shown by the debenture-holders, who had agreed to take deferred interest warrants for their interest during the past year, and had also renewed the principal monies of their debentures for a period of two years, in order to give the company time to see whether the position of matters at the mine would not improve, was much to be commended. The gold produced during the year amounted to about £580 less than that of the previous year, and the expenses, as shown in the mine working account, were something like £250 less than during 1892. It would be observed that the difference in exchange amounted to the large sum of over £3000. This, as he explained on a previous occasion, was caused by their having a fixed rate of exchange at the mine for book-keeping purposes, and when the current rates fell lower the accounts showed a large gain to the company; the average rate current for the year, as shown by the table of statistics, having been 12½, and as a matter of fact the exchange had gone below 10d. at the end of the year, whereby their results had profited very considerably. The tonnage of ore raised during the 12 months had fallen off by about 1400 tons as compared with 1892, and the quantity stamped was less by about 400 tons. The average value of the stone stamped was 2-816 oitavas of gold per ton, or approximately 24s. per ton, which was rather lower than they had had for some years past, and was chiefly accounted for by the principal stope worked (No. 8) having proved poorer than usual. A great point of interest in last year's workings was the discovery or intersection of a new lode in a shallow part of the mine in the month of August last, as named in the report, and probably Mr. Thomas Tregellas, who had spent so much time at the mine in former years, could give some information of interest as to the position of this new lode, which might possibly be a matter of great consequence to the future of the company, for if this lode were to turn out of value, and to give a large quantity of ore of any fair standard of yield, it could in the shallow part of the mine—only some 18 fathoms from the top of the hill, or, speaking roughly, apparently something like 50 fathoms above the deep adit level—be worked cheaply and to much better advantage than their present deep workings. Indeed, it was possible it might give them a new mine, so to speak, at a shallow horizon. It was, of course, premature to say that this new lode would prove of value, but according to Mr. Treloar's report it had an encouraging appearance. They hoped to have more interesting advances as to it shortly. So far the short supply of explosives had interfered with the development of this lode. From the fact that the mine in its deepest points of working was now looking better than it had been for some years past, he thought they should have strong hopes that the corner was at length being turned. The difficulty in procuring a sufficient supply of labour he feared they would have with them for some time to come, until the importation of some foreign labour should make the native supply more plentiful, but if they obtained better ore, then it was but reasonable to hope for profits in the working of the mine. It had been a difficult matter for Mr. Treloar to keep the works in operation at Pari during these last few months, the want of a proper supply of good explosives being severely felt by him; and, indeed, at one time it was feared that the stoppage of the mine would have resulted, but this had been averted by the utilisation of some inferior explosives, which had been in stock at the mine for some time past. Now that the political disturbances were at an end—they had terminated at Rio about the middle of March—it was to be hoped that the usual supply of dynamite could be obtained from Rio, and the operations proceed as formerly. Much praise was due to Mr. Treloar for his exertions in keeping the mine at work during the trying time experienced in Brazil during the past few months.

Mr. JAMES H. DENNIS (director) seconded the resolution adopting the report.

Mr. THOMAS TREGELLAS (director) said that with reference to the new lode a letter received by him from Mr. Treloar, under date of the 10th August last, stated that within the last week they had cut the parallel lode at the mine considerably further south than where proved near the mouth of the adit, but they had not seen enough yet to say whether it is worth anything. Their level, which is opposite the north end of the whim-round, had been driven 28 fathoms before it reached the lode, and the last 4 fathoms were in wet ground. The lode the mine is on is also worth nothing so far as we have seen back north, consequently we are in hope that the influence which improved it south may have had the same effect on the parallel lode south. The latter is showing mundic, and the stones blasted yesterday showed spots of garnets also—all good indications. It may prove to be of no value, but if the reverse, we shall have a new mine almost from the surface. Mr. Tregellas then proceeded to say that regarding the mine generally various causes had tended in past years to militate against the prosperity of the company, and many changes had taken place as regards the auriferous quality and size of the lode worked upon. If they looked back to the time previous to the crash that occurred in the year 1882, it would be seen that the stopes generally were shortening and falling off, so as to cause some anxiety, and yet subsequently, in the first stope under the bar of lode, the lode yielded in seven months time 43,000 oitavas of gold, when no one expected that this would happen, since the bottom of the old mine had deteriorated so much as it did; with this example of recovery in the value of the lode why should not a recurrence of the improvement be experienced in the present deeper workings. Certainly they had had much more poor stone at the mine these last few years than was experienced at the time he referred to, but as compensation it was possible that they might have a longer period of good lode, and, perhaps, better than ever; there being no reason whatever to suppose that the poor zone they had been going through at Pari was not likely to come to an end—on the contrary, the chances were that it would come to an end, and the lode be better than ever it was before. Apparently this change for the better was taking place, and the bottom part of the mine never looked better than at the present time. No doubt the want of more bands was severely felt, but there was a hope that at no distant period foreign labour would be available. The machinery on the mine was ample for carrying on the works for some years to come, and the improvement in the lode, as well as the recent discovery of a parallel lode, being all taken into consideration, ought to prevent shareholders giving way to discouragement as to the future of the property.

After some discussion, the resolution was put to the meeting and carried unanimously.

Resolutions were then passed re-electing Mr. Thomas Tregellas and Mr. William G. Holland directors of the company, and reappointing the auditors, Messrs. Chalmers, Wade, and Co., a hearty vote of thanks being accorded to Mr. T. S. Treloar and the staff at Pari for their services in the interests of the company during the past year, the meeting terminating with a vote of thanks to the Chairman and directors.

**NORTH WALES COAL MINERS' FEDERATION.**—A new departure was taken by the North Wales Coal Miners' Federation at a meeting held on Monday at Wrexham. The agent for Flintshire, Mr. Peters, brought forward the suggestion that the quarrymen of Carnarvonshire should be allowed to join the North Wales Miners' Federation. A delegate questioned whether the Coal Miners' Federation of Great Britain, to which the North Wales Federation is affiliated, would accept quarrymen as members. Mr. Peters assured the meeting that they would. After a lengthy discussion it was resolved to admit the quarrymen, who number some 13,000, as members of the North Wales Federation.

## MASON AND BARRY, LIMITED.

### A Conservative policy of directorial management.— The probable life of the mine.

The second annual, or third ordinary, general meeting of the members of Mason and Barry (Limited) was held on Monday, at the Cannon Street Hotel, the chair being occupied by Mr. FRANCIS TREES BARRY, M.P.

The SECRETARY (Mr. J. G. Barry) read the notice convening the meeting.

The CHAIRMAN said:—In placing before you the company's general balance sheet at 31st December, 1893, and asking for your approval of it, I wish to remind you that at our last annual meeting I stated that your directors were of opinion that the wisest course for this company to adopt, under the existing circumstances, was to restrict the breakage of ore at the mine, and to aim at turning into cash the large sum of £362,000, showed in the balance sheet of 1892, as looked up in the unwritten off cost of the ore lying at the cementation works, on which, as respects copper production, the royalty had already been paid. That has been the policy which the board have followed during the year 1893, and I think I may claim that the balance sheet now before you is a proof that this line of action has been prudent and successful, for as you will see in it the amount standing against the cost of ore at cementation works has been reduced by the sum of £50,493, whilst the cash assets have grown from £166,927 to a total of £273,587, or an increase of £106,660. You must understand that this difference does not represent profit to any material extent, but only the turning of stocks of ore and precipitate into cash, by which means we are enabled to propose the return of £1 per share on account of capital at the extraordinary meeting that immediately follows. The directors' report has informed you that the breakage of ore at the mine, as foreshadowed in my speech at the last meeting, was purposely reduced during 1893 to 209,814 tons, of which 172,636 tons were added to the heaps at the cementation works; whilst the quantity of ore shipped during 1893 amounted to 172,376 tons, as against 130,756 tons shipped in 1892, or an increase of 41,620 tons; and the quantity of ore invoiced for its sulphur value amounted to 182,909 tons, as against 116,619 tons in 1892, or an increase of 66,290 tons. Much the greater portion of these sales are, of course, from the ore that has been treated at the cementation works for the extraction of copper. Our make of copper precipitate during 1893 has been almost equal to that of 1892, and notwithstanding two unfavourable winters as regards rainfall (and our water requirements as you may be aware being very large) we feel sanguine that our production of copper for the current year will be equal to that of last year, or nearly so, thanks to the slightly increased rainfall during the recent months. Unfortunately the directors have again had to record in their report a fall in the value of copper. At our last annual meeting I mentioned that the average value of copper during 1892 was £5 14s. per ton less than the value of 1891, and now I have to remind you that the average value of copper during 1893 was again £1 18s. per ton lower than in 1892, which means a less price for our copper, comparing the years 1891 and 1893, of £7 12s. per ton, or a loss of profit on our copper make for 1893 of some £25,000, which is equal to a reduction of dividend of 2s. 6d. per share. Indeed, with the present low value now ruling for copper, the price being under £40 per ton, there is hardly a margin at all for profit on our copper made with ore of the character that our mine is now producing, and with workings as deep down as ours are. I went very fully into this subject at our last meeting, and it is, therefore, not necessary for me to go over the same ground again. When I last addressed you I alluded to the amount of royalty we are forced to pay under the terms of the lease which we hold. I mentioned that we had endeavoured to secure some reduction in the scale of royalty, fixed as long ago as 1876, when copper and sulphur were at very much higher prices than they have averaged of late years, and when the character of our ore for copper value was very much different to what it now is, but had not been successful. I have now to inform you that, although we have been unable to secure any general reduction in the scale, we have been able to come to an agreement with La Sabina Company, under which a particular class of ore now being broken may be shipped at a reduced royalty, and we are thus able to offer that particular quality of ore at a lower price than could have been done had we been forced to pay on it a royalty as fixed by the old scale. With this reduced royalty we are hopeful that we shall be able to increase our sales of sulphur ore to the advantage both of this company and of La Sabina Company. At our last meeting I mentioned that the total royalty paid to La Sabina Company for the year 1892 amounted to £40,278, of which total the sum of £11,028 had been returned to us as dividend on the shares held by this company. During 1893 the total royalty paid to La Sabina Company has amounted to £31,570, and of that sum we have received back in dividends, as shown in the present profit and loss account £8573. You will notice that we write down the value of our shares in La Sabina Company by £4500, and we propose to continue this course, because, although our portion of the royalty paid amounted, as I have just told you, to £8573, yet the eventual value of these shares will probably be nil. Referring to my remarks at our last meeting, I am pleased to say that we have been able to effect some considerable economy both here and in Portugal. I also mentioned at our last annual meeting that it was the intention of the directors, as soon as the financial position of the company would permit of our doing so, to propose the payment to you of £1 per share on account of capital, and it will be gratifying to you to know that the directors consider the company is already in a sufficiently strong financial position to make the suggested payment. The solicitor of the company, at the extraordinary general meeting which will immediately follow this meeting, will explain to you that it will probably be some little time before we shall be able to obtain the sanction of the Court to the proposed reduction of capital, and we do not anticipate, therefore, being able to make the payment before September next. The dividend we are now submitting for your approval is not a large one, but it is as good a one as we can earn with the present low price ruling for copper. Following the course we pursued last year, it is not the intention of the board to declare an interim dividend in October, but to wait till our next annual meeting. During the current year we shall endeavour to follow the same policy that has been so successful in 1893—that is to say, we shall continue to make every effort to turn into cash our fixed assets, and shall be quite satisfied if in the future we are able to declare the payment of a small dividend year by year, and, at the same time, gradually accumulate money, so as to be able to make further repayments on account of capital. The turning into cash of our heaps of ore depends on so many varying circumstances, such as the state of particular trades in different countries, the rate ruling for freights to different parts of the world, and other technicalities, that we cannot say with any certainty when we are likely to be able to make another repayment, but we confidently hope that in the course of a few years—if we be fortunate, a very few—we shall again call an extraordinary meeting to ask you to sanction a further repayment on account of capital. I will now propose the following resolution:—

That the directors' report (No. 2) and the general balance sheet at 31st December, 1893, as signed by the auditors, be received, adopted, and entered upon the minutes, and that a dividend for the year ending 31st December, 1893, be now declared at the rate of 2s. per share, free of income tax, the same to be payable on and after Thursday, the 17th inst.

Mr. J. P. MARON seconded the resolution.

A SHAREHOLDER enquired what quantity of fine copper was taken out of the ore shipped.

Mr. MARON said that out of 172,000 tons of ore shipped about 51,000 tons came straight from the mine, part of which contained 1 per cent., besides which there was a quantity of yellow ore containing as high as 10 per cent. The remainder of the ore was from the cementation works, and had already undergone extraction for copper, and out of 130,000 tons they got roughly about 540 tons of pure copper.

A SHAREHOLDER enquired whether there was no improvement in the quality of the ore extracted.

Mr. MARON said there was a small improvement—under ½ per cent.

A SHAREHOLDER suggested that the company should be turned into a trust investment company. As a copper mining company the concern was really in a disastrous condition, and it was only the assets which kept the company afloat. He wished to know whether any return had been got for the money which had been expended upon litigation. Last year he had asked for some particulars as to the amount expended upon the management in Portugal, and he should like to repeat the request.

Mr. SARGEANT was of opinion that the directors had carried writing-off to an injudicious extent. He suggested that a committee of four or five large shareholders should be formed to go into the company's finances with the board.

The CHAIRMAN said the older shareholders in the company would remember that the price of copper had gone down from £70 to £40 and even lower, and, taking into consideration the change which had taken place in the quality of the ore, he thought the shareholders would agree that up to the present time the board had guided the ship pretty well. The mine could not exist for ever, and it was thought that, in the ordinary course of things, it had about 10 or 12 more years of life before it. To appoint a committee to confer with the directors would be a mark of want of confidence in the board. He had been connected with the company for 35 years, and he had no desire to desert the ship; otherwise he should have been glad to have severed his connection with the company some time ago. If, with their long experience, the board could not make the company a success, it stood to reason that a committee of shareholders, who would be quite new to the business, would not be able to do so. With regard to the outcome of the litigation they had already realised, roughly, £20,000.

Mr. MARON remarked that the sum of money expended in Portugal on the mine had amounted to £41,873, what proportion of which was management expenses it was very difficult to say. Perhaps some £4000 or £5000 of that sum went in the salaries of the higher officials.

Mr. BEDDINGTON, one of the directors, expressed strong approval of the action of the board in writing off for depreciation, seeing that when the mine was exhausted the value of the docks and railway would be merely that of old iron.

The motion was then put and carried unanimously.

Mr. J. Mason and Mr. H. E. Beddington, the retiring directors, having been re-elected, and the auditors, Messrs. Joselyne, Miller, and Blow, having been reappointed, the first part of the proceedings terminated.

An extraordinary meeting was held subsequent for the purpose of considering a proposal to reduce the capital.

The CHAIRMAN formally moved:—

That the capital of the company be reduced from £1,050,000, divided into 210,000 shares of £5 each, to £340,000 divided into 210,000 shares of £1 4s. each, and that such reduction be effected by returning to the holders of the shares that have been issued, and to the parties entitled to have fully paid shares issued to them, paid up capital, to the extent of £1 per share, and by reducing the nominal amount of all the shares from £5 to £4.

Mr. MARON seconded the resolution.

Mr. BISHOP remarked that it would be necessary to get the sanction of the Court of Chancery after the resolution had been confirmed, and the Court would have to be satisfied as to the creditors of the company, which could easily be done, as they had practically no creditors. He hoped they would be able to make the payment about September.

The motion was then put and carried unanimously, after which the proceedings terminated.

## EAGLEHAWK CONSOLIDATED GOLD MINING COMPANY, LIMITED.

The first ordinary general meeting of the Eaglehawk Consolidated Gold Mining Company (Limited) took place yesterday at Winchester House, Old Broad-Street, Mr. JOHN WALLACE (the Chairman) presiding.

The SECRETARY (Mr. J. Durie Pattullo) read the notice calling the meeting.

The CHAIRMAN said the special work taken in hand after the reconstruction had been carried through was sinking the shaft to a depth of 1000 feet. There had been a considerable amount of preparatory work, but now all the machinery and buildings had been provided to the entire satisfaction of the directors. Reefs had been found in neighbouring mines at a depth of 1000 feet and over, but, so far, no reef had been found in the mine. They were now down 930 feet, and it was proposed to open out at a depth of 1000 feet, and endeavour to find a reef. He could only say he had never seen men more assured of success than their colonial directors. The board now proposed to ask for power to call up the remaining 1s. of the authorised capital, but it was hoped that only a small amount of it would be required.

Mr. EDWARD HARRIS thought it would be advisable to have a fresh report on the mine from Mr. Nicholas, or some other expert, before expending the remaining 1s. per share.

General BRADLE supported the board in making the call, and was prepared to pay it.

The motion of the CHAIRMAN, seconded by Mr. E. G. KEITH, for the adoption of the report and accounts was unanimously carried.

The CHAIRMAN then moved:—

That the meeting sanctions the calling up, and the directors of the company be, and are hereby, authorised to call up the remaining 1s. on the ordinary shares of the company, in accordance with the Articles of Association.

That meant 3d. calls, with three months' interval.

Mr. C. A. HANDEY seconded the resolution, which was agreed to.

Mr. MORTIMER moved:—

That the board be requested to obtain the opinion of Mr. Nicholas, or some other competent engineer, as soon as the shaft is sunk to the depth of 1000 feet, and to report fully as to the prospects and future working of the mine.

This was seconded by Mr. HARRIS, and agreed to.

The retiring directors, Messrs. C. A. Handey and W. B. Gray, were re-elected, as were the auditors, Messrs. Monkhouse, Goddard, and Co., and the proceedings closed in the customary manner.

**MINERAL ACT AMENDMENT IN BRITISH COLOMBIA.**—The new amendment to the Mineral Act, which extends the time for the performance of assessment work on mineral claims for the current year till July 31, 1895, does not meet with the approval of everyone. It will be quite convenient for the holders of claims, who are not in the position for doing their assessment work, but it will also deprive the prospectors and miners of considerable work. This incidentally curtails the business of the merchant, and so it falls out that while the amendment may be a very desirable one it will displease more than it will please. There are individuals and companies in this district who hold a large number of claims, on which, during the coming summer, assessment work must have been done but this above resolution of the legislature. We are able to count up several thousand dollars which must thus have been spent in giving employment to practical miners, who will not now benefit by the expenditure—at least during this year. Whether this will be balanced by the advantage to impecunious individual holders of claims known to the proposer is a question which does not seem to have been at all debated in the house. There has been no discussion as to the need of our having a practical representative in the next legislature. There was some talk of organising and formulating a protest against the passage of such an amendment, but the time for action was very short, and the matter dropped.—*The Miner, B.C.*



## SOUTH AFRICAN GOLD TRUST AND AGENCY COMPANY.

### A dividend of 10 per cent.—Cordial agreement upon reconstruction.

The fifth annual general meeting of the shareholders of the South African Gold Trust and Agency Company was held on Monday, at the Cannon-street Hotel, the chair being occupied by Mr. H. E. M. DAVIES.

The SECRETARY (Mr. W. F. Andrewes) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen, in submitting the annual report and accounts for the past year, I will not detain you many moments, more particularly as there is a second meeting to follow. The balance-sheet shows on the face of it the position of the company in as much detail as need be, but, as several shareholders have written to me upon minor points, I propose to go through the balance-sheet and deal with the items *seriatim*. (Hear, hear.) The capital stands as last year, as does also the reserve fund. The loans against securities last year stood at £50,000; on December 31 they stood at £44,000, and since then they have been considerably reduced by the sale of £35,000 temporary investments appearing on the other side. Creditors and bills payable last year amounted to £13,000; they stand at the present time at £4845, so you will see we are gradually reducing our liabilities. The investments in Consolidated Gold Fields amount to £161,010, being 99,420 shares at the average cost of £1 12s., while the present market price, I believe, is about 2 9-16ths. South African Deep Level and other companies' shares stand at £11,455; they consist of shares in the Champ d'Or Deep Level Company, bought at 7s. per share. Some of these have since been sold at 12s., and the market stands now at about the same. Mortgages and advances stood in 1892 at £33,425, and on December 31 at £16,000, and since then they have been reduced by another £6000, making mortgages at the present time only about £10,000; so that we are gradually getting in all our outstanding advances. Sundry debtors are £2789, and the debts have all been collected, with the exception of about £249, which, I believe, are perfectly good. The bills receivable stand at £3000, and are quite good. The venture account which I referred to at the last meeting stands at £2874, and we have written off £1000. We have decided to abandon the flotation of the property in respect of which we held an option. Although we think it is good, we do not think the times are ripe for floating new companies just now, and we had to elect whether we should go on or sink what we had already put into the property. We decided that rather than put more money into it we would abandon our option. At the same time, the people who held the property met us fairly, and told us that, as we had supported them and helped them for so long, they would give us an interest in the property. Therefore, we have written off £1000, and £2700 remains against what we are to receive in this property, and our share is not yet settled. Temporary investments are £35,388; they have all, since the date of the balance sheet, been sold, and have realised a profit of some £2000. The cash in hand speaks for itself. Now, as to the revenue account. Turning first to the general expenses in London and South Africa, last year they were £3595; this year they come together to £2331, showing a reduction of some £1200 during the year. Interest last year was £1816, and it is now reduced by some £900. Coming now to dividends on investments, the profit realised this year is somewhat less than it was last year; but it is a much more satisfactory profit, because last year, to pay the dividend, we sold out some of our investments, we realised some of our Gold Fields shares for the purpose of paying the dividend, and this year the profit comes from the dividends on the investments themselves. (Hear, hear.) Of course, if we sold our Gold Fields this year, we should have been able to pay much larger dividends; but we have preferred to hold them for better prices, which we think we shall get. Therefore, we have not disposed of them, but have been content to rest on the dividends from the investments. This brings me to the profit and loss account. I said last year that some bad debts had to be expected during the year, and, therefore, we had made provision for them. Those debts have, unfortunately, turned out bad, amounting to £2000 odd; but we have faced them, and written them off. This leaves a balance of £13,513 available for distribution, and we propose to dispose of this by paying 10 per cent. on the ordinary shares and 5s. 3d. on the founders' shares, carrying forward £388 18s. to the credit of the current year. (Hear, hear.) In regard to the new business referred to in the report, it does not appear on the balance-sheet, because, although we entered into that business last year, no payments were made in respect of it until the current year. As usual, a large amount of business was offered to the board during the year, and, as in duty bound, we looked into it; but we only took up during the year two new pieces of business. One was the guarantee of 50 per cent. of £25,000 working capital in the Nigel Deep Company, formed to acquire some 50 claims in the dip of the Nigel Reef. This interest was acquired for us by Mr. Percy Tarbutt when he was in Johannesburg last year, and the best guarantee I can give you as to its being a good enterprise is that Mr. Tarbutt is a half partner in the transaction. (Hear, hear.) The other piece of business is the guarantee of one-third (£8000) of the working capital of a gold-bearing property known as the D'Arcy Estate, in Australia. Both these investments were at the time strongly recommended, and I trust they will prove as profitable as they were represented to us when we went into them. We have also entered, in the present year, into some more new business; but I must not trench upon the next year's report. I merely mention it now to let you know that we are not asleep, but are still keeping our eyes open for business. (Hear, hear.) In conclusion, let me refer to our great asset—our holding in the Consolidated Gold Fields of South Africa. Last year I dealt with the position of our splendid asset in this company. All I said then holds good now, only in a greater degree. The Consolidated Gold Fields during the year has raised £600,000 debentures on favourable terms, and the bulk of this money has been invested in deep level and outcrop properties by Mr. Charles Rudd and Captain Rhodes, on the spot. Mr. Rudd, I believe I am correct in saying, comes home with the biggest amalgamation scheme which has ever been attempted in the Witwatersrand. The Gold Fields interest in that is the major part of it—that is, the Gold Fields holds the bulk of those claims, and when I tell you that a claim contains, roughly, £50,000 billion you can imagine what is the magnitude and what profits there ought to be on that transaction. (Hear, hear.) I think I have now dealt with all the points that call for mention in the report, and referred to the business we are doing as fully as I can. I now beg to move that the report and accounts be received and adopted. (Applause.)

Mr. W. M. FARMER seconded the motion.

Mr. JAMES PRICE understood that if the company sold its interest in the Gold Fields Company it would secure a profit at the present time of £100,000. He would like to enquire whether it would not be advisable to take that profit.

The CHAIRMAN replied that the directors did not propose to kill the goose that was laying the golden eggs. (Hear, hear.) The motion was then put and unanimously agreed upon, together with a further resolution declaring a dividend of 10 per cent. on the ordinary shares and 5s. 3d. per share on the founders' shares.

The retiring directors (Messrs. Davies and B. de C. Nixon) having been re-elected, and the auditors (Messrs. Jackson, Pixley, and Co.) having been re-appointed, the first part of the proceedings terminated.

The meeting was followed by an extraordinary general meeting, for the purpose of considering, and, if thought fit, passing the following resolutions of reconstruction:—

(1) That it is desirable to reconstruct the company, and, accordingly, that the company be wound up voluntarily, and that Mr. H. E. M. Davies, Mr. W. M. Farmer, Mr. B. de C. Nixon, Mr. T. Rudd, Mr. J. J. Hamilton, and Mr. P. Tarbutt be, and they are hereby, appointed liquidators for the purposes of such winding up.

(2) That the said liquidators be, and they are hereby, authorised to name the South African Gold Trust (Limited), with a Memorandum and Articles of Association which have already been prepared with the privity and approval of the directors of this company.

(3) That the draft agreement submitted to this meeting, and expressed to be made between this company and its liquidators of the one part and the South African Gold Trust (Limited), of the other part, be, and the same is hereby, approved, and that the said liquidators be, and they are hereby, authorised, pursuant to Section 161 of the Company's Act, 1862, to enter into an agreement with such new company, when incorporated, in the terms of the said draft, and to carry the same into effect, with such, if any, modifications as they think expedient.

The CHAIRMAN, in moving the resolutions, said: Let me preface my remarks by saying that I do not hold a founders' share, nor have I done so since I became Chairman of the company. Founders' shares have been under a cloud for some time now, and I think he would be a bold man who ventured to start a new company with founders' shares at the present time. We must not forget, however, that for the existence of this company we are indebted to the founders; and, moreover, they transferred to us a good business—not a new idea which had to be proved. Those, therefore, who are satisfied with the existence of the company should not quarrel with the founders. The original capital of the company was £100,000, having £50,000 called, and when the capital was doubled a mistake was made in not then dealing with the founders. All the founders provided for themselves when they started the company was one-fifth of the profit earned on £50,000, and on a further £50,000 if the company proved the success they anticipated—that is, £100,000 in all. Instead of calling this £50,000, however, the directors doubled the capital, making a paid-up capital of £105,000 and an uncalled capital of equal amount, thus giving the founders really more than they ever provided for themselves. Of course, the calling up of the uncalled capital would give an additional value to the founders' shares; but the directors, recognising they should have dealt with the founders when they increased the capital, have not called up this 10s. per share, nor have they any intention of doing so. The company is, therefore, at a deadlock in regard to increased working capital, and the ordinary shareholders are saddled with a liability of 10s. per share, which I am convinced they would gladly be quit of. Now, it is right that the will of the majority should prevail, and the ordinary shareholders are in an overwhelming majority as regards the founders. As a good Conservative, however, I say the minority must be respected and fairly dealt with. Another disadvantage in having founders' shares is that under the articles they draw one-fifth of the profits, whether the ordinary shareholders divide the remaining four-fifths or not. In the year that we paid 100 per cent. I would gladly have seen the dividend reduced to 25 per cent., and the balance kept for the rainy days we then had before us; but we had to pay out to the founders their pound of flesh, so the board decided to treat all alike. Without founders we could build up a good reserve in prosperous years, and thus average our dividends. A strong argument in favour of cancelling the liability on the ordinary shares, and issuing 80,000 reserve shares when a favourable opportunity occurs, is that in the present sound financial condition of the company they will yield more than the uncalled capital. I hope in these preliminary remarks I have made out a case to your satisfaction for converting the founders into ordinary shares, and also for cancelling the 10s. liability on the ordinary shares. Now for the scheme itself. We recommend it to you as set out in the report—i.e., that we register a new company, with a nominal capital of £250,000; that we give the ordinary shareholders one and a third share for every two now held, 10s. paid, together £140,000; that we give the founders three shares for every one now held, together £30,000; that we hold in reserve £80,000; making up the total capital of £250,000. You will ask on what basis this arrangement has been arrived at. Well, up to a point on the basis of a report by Messrs. Turquand, Youngs, and Co. on the relative values of the founders' and ordinary shares, having regard to the reserve fund created and the market appreciation of stocks taken in the balance sheet at cost. All the facts and figures have been most carefully and fully laid before Messrs. Turquand, Youngs, and Co. by Messrs. Markby, Stewart, and Co., our legal advisers, who write us that Messrs. Turquand-Youngs' report appears sound, and should be satisfactory to the holders of both founders' and ordinary shares. The sum and substance of Messrs. Turquand, Youngs, and Co.'s report is that the ordinary shareholders should get one share for every two now held, 10s. paid, and the founders two shares for every one founders' share now held; that is, 105,000 shares to the ordinary shareholders and 20,000 shares to the founders. But we wished to at once give our shareholders back in scrip some part of the reserve fund and accretions of capital; we, therefore, added one-third on the ordinary shares, which increased the number from 105,000 to 140,000, and one-third on the founders', which increased the number from 20,000 to 26,666 shares, which is strictly in proportion to the valuation of Messrs. Turquand, Youngs and Co. But, you will say, in your scheme you have given the founders 3334 shares more than Messrs. Turquand-Youngs say they are entitled to. That is so. While Messrs. Turquand-Youngs' report was in course of preparation, I opened negotiations with the largest holders of founders' shares, thinking that if I could satisfy him as the largest holder of founders' shares I should satisfy others. He was as hard a nut as I ever had to crack; he had all the facts and figures before him, and I finally satisfied him that 30,000 shares was a fair and equitable basis on which to buy out the founders. I was not very proud of my bargain—I have made better; but I was much relieved to find the figure within 3334 shares of Messrs. Turquand's report, and I strongly recommend it to you as giving the founders what the biggest holder among them thinks fair, while at the same time it gives considerable relief to the ordinary shareholders. To sum up, we get rid of two classes of shares—we wipe out the liability of 10s. per share, and, *qua* the present ordinary shareholders, we get them £2000 more profit out of every £25,000 earned. (Applause.)

The SOLICITOR (Mr. Stewart) read to the meeting the heads of the agreement for the reconstruction scheme.

Mr. FARMER seconded the resolutions.

Mr. PRICE said that the Chairman's able and clear statements had left very little room for criticism, and that little objection could be taken to the scheme. The board having managed the company so well, it would be unbecoming on the part of the shareholders not to place confidence in them as to the scheme now before the meeting.

Mr. SAUNDERS thought the terms offered to the ordinary shareholders were too favourable.

The CHAIRMAN remarked that some criticism on the part of founders' shareholders was to be expected, but he might mention that the largest holders of founders' shares were on the board at the present time, and they were quite satisfied that this was as good a bargain as they could fairly expect. (Hear, hear.) The resolutions having been put and carried with six dissentients, the proceedings concluded.

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the shareholders more than all the rest, and concerned him too. They were fortunate in having a young, energetic, and most capable manager, who was always making headway as regarded their progress. Mr. Charlier was not satisfied with one improvement, but he immediately started again on some further experiment, and only that morning they had had a very serious discussion with him about some very great improvements which the manager believed himself to be on the eve of accomplishing. The shareholders would want to know what these sales meant in the way of dividends. Well, they had considered this question with Mr. Foster, the secretary, who went deeply into all these matters, and he considered that when the company were selling at the rate of £2000 a month they were paying all expenses. Well, that was a great point to have arrived at. The greatest amount that Mr. Charlier had sold in any one week had been 82 tons. During last week he sold 60 tons of white lead—35 tons ground in oil and 25 tons dry. They preferred to sell it ground in oil because they got more profit out of it, and they were more confident that it was going to be used in the best condition. So far as they could estimate, 40 tons per week, or £2000 of sales per month, more than paid all expenses; when they got up to 60 tons per week they hoped to be earning a dividend, and when they got to 80 tons, which they had done for one week in the past year, they hoped to earn 5 per cent. Of course, before they paid any dividend there was a loss of £28,000, incurred during the last four years in keeping the company's extensive works going, and in experimenting and arriving at their present state of what he might call perfection of manufacture, that would have to be dealt with, and that would be done by the sale of patents. Such a sale, however, would not be easy to effect until they arrived at a 5 per cent. dividend. Certain gentlemen had gone over their works, and spent day after day there in examining their processes and products, and they had expressed themselves well satisfied with everything, except what they called the commercial side of the question. The company could not expect to get a very good price for their patents in foreign countries until they had arrived at that 5 per cent. dividend, which they would try to do as soon as possible. It would be seen that since the shareholders met six months ago satisfactory progress had been made, and he thought it was far easier now to double their present output and sales than it was to pass from the state that they were in 12 months ago to their present condition. He could assure them that he and Mr. Charlier would do their best to attain that position as soon as possible. The Chairman then moved the adoption of the report.

Lieut.-General Sir JOHN STOKES, K.C.B., seconded the resolution. Replying to a SHAREHOLDER, the MANAGER said that sales to the extent of £4000 a month on an average would give them a 5 per cent. dividend.

The report was adopted.

In moving the re-appointment of the Chairman as a director, Sir JOHN STOKES said that had it not been for the pecuniary sacrifices which Sir Henry Tyler had made for the company—some £27,000 in all—the whole thing must have come to an end long before this. It was owing to that gentleman's thorough conviction of the excellence of their patent, and his determination that he would not be allowed to fail for want of funds to prosecute it, that they had arrived at the position in which they now stood, and where they had the fairest hopes of making the venture a great success before very long. He coupled with the motion a vote of thanks to Sir Henry Tyler.

The motion was carried, and a vote of thanks was passed to the manager, who, in reply, said he had more faith in the process than when he last met the shareholders. Matters were going on most satisfactorily. They were still finding out greater economies in the mode of production, and he thought they had nearly reached the acme of success, so far as production was concerned. He believed that at the end of the present year a most favourable balance sheet would be presented.

Replying to a vote of thanks to himself and the board, the CHAIRMAN said he was determined to carry this thing through to a successful issue. (Applause.)

## THE NITRATE RAILWAYS COMPANY.

### A dividend of 20 per cent.—Splendid prospect for the future.

The 12th ordinary general meeting of the Nitrate Railways Company (Limited) was held at Winchester House, on Tuesday, the chair being occupied by Colonel NORTH.

The SECRETARY (Mr. J. M. Cowper) read the notice convening the meeting.

The CHAIRMAN, in moving the adoption of the report and accounts, said the company had met with opposition, and there had been a great deal said as to what was about to be done, but, after all, there was only one permanent railway, and that was the Nitrate Railway, in which they were all interested. After paying the dividend of 20 per cent. there was a better prospect of continuing dividends than ever there was before. (Cheers.) To begin with, the Lagunas works, which was the biggest of the lot, would soon be making a considerable quantity of nitrate. He held a large interest in that concern, and they might depend upon it that the whole of the production from that source would come down over the Nitrate Railways. There was also another nitrate works, called the Buenaventura, of which he held over one-half, which would commence work within a month, and the nitrate from that works would also come down over the line. He would draw attention to the fact that the company had taken up the machinery to make this nitrate, but they had carried no nitrate down from these works yet. The machinery was taken up at a five per cent. gradient, but the nitrate would come down at little or no expense, for a few brakemen could easily bring down 300 or 400 tons at a time, and this advantage, for which they had been waiting long, was coming now. The board were working in harmony with the nitrate makers, and were, in fact, giving £10.0 towards the Permanent Nitrate committee. They had reduced the freights, and had justly made contracts with four different oficinas, and put them on the same terms. Great credit should be given them for the manner in which the railway was being worked, and he would ask whether there was a line in the world that any of them knew about which was worked at 35-45? (Applause.) This seemed to him very creditable, especially when they considered the amount paid for repairs, what they had to pay for coal, and the £30,000 or so a year for water. Despite all that, and the heavy wages they had to pay, they were able to make this money, and there was no reason why they should not continue to pay the dividend they were now paying, namely, of 20 per cent. (Cheers.) Another matter he should like to refer to, and that was that they had decided, so as to give other people a chance, to make the ordinary shares payable to bearer, which he believed would enhance the value of the shares. (Applause.) This would give the people of other countries a chance to do business with them, which they wanted. The board had submitted an elaborate report, but if any shareholder wished for further information he would be ready to afford it. They had had several law suits, but he did not give these much consideration; in fact, he believed most of them had been already settled. Colonel North concluded by moving the adoption of the report and accounts. (Applause.)

Mr. R. R. LOCKETT, the Vice-Chairman, seconded the motion.

A SHAREHOLDER enquired whether the arrangement of having the shares made payable to bearer was an optional one.

The CHAIRMAN replied in the affirmative.

A SHAREHOLDER asked for some information as to the period at which the company's concession would terminate.

The CHAIRMAN said the company would be in a much better position with the Chilean Government if they had no concession, so that anybody who wished to do so might come and compete with them. At the present time their competitors had hardly succeeded up to their expectations. But in regard to the concession, the company would hardly be at all harmed if it were declared null and void.

## WHITE LEAD COMPANY, LIMITED.

### An encouraging report—Increase in the sales.—Brighter prospects.

The above-named company held its ordinary general meeting on Monday, at the City Terminus Hotel, Cannon-street, E.C., under the presidency of Sir H. W. TYLER.

In moving the adoption of the report, the CHAIRMAN stated that during the past year the lowest sales in any month were £1100 in January, and the highest £2400 in October, and he was happy to be able to add that in the first four months of the present year they had sold their products to the extent of upwards of £2100 per month, on an average, and that was so far satisfactory. It had been very uphill work as yet, but one could not expect anything less than uphill work, because it was no light matter to disturb an existing and long subsisting trade, which they were doing, and to take its place, which they were very confident of doing. But they must have a little more patience yet, and then he thought they would arrive at the dividend paying part of the business, which concerned



to-morrow. Up to the present the company had sustained no harm from competitors, and he did not suppose they ever would.

The motion for the adoption of the report was then put and carried unanimously.

The CHAIRMAN moved the re-election of Mr. Robert Harvey and Mr. Edward Manby, the retiring directors, saying that the former gentleman had been for a large number of years, not only a director of that company, but also of several nitrate companies, and had performed useful service in combining the nitrate and the railway interests, while Mr. Manby knew more about the line than anybody.

Mr. J. J. SMITH seconded the motion, which was carried unanimously.

Mr. EDWARD MANBY, in answer to an invitation from the CHAIRMAN to say something of the company's line, which he had visited during the course of last year, said that he had gone over the line several times, and had found it in the most absolutely perfect state of repair and management as could be seen, in fact, from the statement of accounts, and the extremely low rate of working expenses, which the CHAIRMAN had remarked upon. If it were possible to improve upon perfection, he thought it had been done since the period of his visit, as the working expenses this year were even lower than those of last year, owing to the improved rolling stock, and the effect of the water they were now using; and owing also to the good management, and to the improvements made in the gradients and curves of the line, which had been concluded during the latter part of last year. It was his opinion that they had the most perfect railway in South America, as far as permanent way, rolling stock, and management were concerned, and he believed no one would deny that in South America. (Applause.)

Mr. WAITE proposed the re-election of the auditors, Mr. E. M. Underdown, Q.C., and Messrs. Deloitte, Dever, Griffiths and Co., and the motion was seconded by Mr. WETHERBY, and unanimously carried.

Mr. J. G. GRIFFITHS, in replying, said that the accounts were an absolutely correct record of the position of the company, which was an exceptionally satisfactory one.

A SHAREHOLDER proposed a hearty vote of thanks to the staff, both in Chile and London, saying they had a very arduous time out in Chile, and one that must have brought great anxiety to them from the highest to the lowest, and also great responsibility. With respect to those in London, many of the shareholders had kept dropping so often into the office for information that the staff must have got tired of answering them. Mr. Cowper, however, had always met them with a pleasant smile, and had been ready to give every information in his power. (Applause.)

The motion was duly seconded and carried unanimously.

A hearty vote of thanks was also accorded to the Chairman and directors.

The CHAIRMAN, in returning thanks, said that, as far as he was concerned, he had a big interest in nitrate—in fact, he might say he was the largest nitrate producer, and he was glad to say they all worked in harmony together. He had been very pleased to hear the reference made to Mr. Cowper's courtesy. The directors were all desirous to give every information to the shareholders in the Nitrate Railways Company, and that could always be obtained from Mr. Cowper on application at the office. The directors were a hard working body of men, who devoted much time to the interests of the company.

The meeting then terminated.

## OTTO'S KOPJE.

Extensive new plant and machinery to be sent out to the mine.

At the invitation of the Chairman and directors of the Otto's Kopje Diamond Mines (Limited) a number of gentlemen, including several members of the Press, paid a visit on Tuesday last to the Chatteris Engineering Works, Cambs., for the purpose of inspecting the new plant which is just about to be forwarded to the property. The visitors were shown over the works by H. R. Marshall, engineer, and Mr. James W. Riley, draughtsman to the company, who carefully explained the plant, which will be known as the "McLelland's Pulveriser Plant." It is only fair to say that the visitors were agreeably surprised at the enormous size of the machinery, and the advantages of its practical use, as explained by Mr. Riley. Those who took the trouble to go down to Chatteris were rewarded by seeing something in connection with mining not often to be met with in this country. Unfortunately the invitations to the Press did not and could not give the faintest idea of what was to be seen, but those who accompanied the party were perfectly satisfied that the present directors are determined thoroughly to test the real value of the property. It has often been said to them—"You have no diamond mine at all, and, therefore, your property is valueless." To this they reply that the property has been proved beyond a shadow of a doubt to be of great value by practical men, and that before recommending the new machinery, Mr. Lisle, the manager, had tested a very considerable quantity of ground, using a similar plant to the McLelland plant, and getting on an average two and a half times per load more than by the ordinary process. Finally, to show their confidence in the mine, the directors had raised the money necessary for the building of the machinery. The following is a description of the McLelland pulveriser plant:—

"The ground is dumped from trucks on to an inclined dead plate and screen, its flow being regulated at foot thereof by an adjustable lip. The smaller ground passing through the screen is then conveyed to the first two sets of crushing rolls by means of an articulated tray conveyor, and the larger stuff, which does not pass through the first screen, is guided into two Baxter stone-crushers, crushed to requisite size, and then by tray conveyors taken to the first two sets of rolls; all finally meeting at foot of first elevator. This elevator performs the duty of raising the ground into the first two sets of revolving screens, in which it is graded into three sizes, part going into pulversators washing the biggest ground, part being conveyed to the next set of pulversators washing intermediate ground, and the remainder being conveyed to pulversators washing smallest ground. The largest ground which is washed out of first set of pulversators is then passed through crushing rollers, and gravitates to foot of second elevator, at which the same operation is performed with the ground as in the case of the first elevator, revolving screens and pulversators. The large ground now passing out of intermediate pulversators is taken through two pairs of crushing rolls, and thence by means of a small elevator into the last set of pulversators. The distribution of ground in these pulversators is effected by a screw conveyor. The residue passing from last set of pulversators is taken by conveyor and discharged into trucks and taken to tailing heaps by means of mechanical chain haulage. Under each set of pulversators is a screw conveyor, taking the deposit to small elevators which discharge into one common creeper conveyor, running the whole length of the plant, and eventually delivering into the wash-up machine, where it is divided and sorted. The pulversators are kept supplied with water by means of two centrifugal pumps, drawing their water from a large settling tank, so that the same water is used over again. The motive force for this plant consists of two triple-expansion engines, of the latest and most approved type, and fitted with jet condensers, steam being supplied from three horizontal tubular boilers."

These engines are being supplied by Messrs. Davey, Paxman, and Co., of Colchester. The entire cost of the machinery, including its erection at the mine and expenses until production, will be about £25,000. Efforts are being made to ship the whole plant by the 26th inst., and Mr. H. Rhodes Marshall, a young engineer of great ability, in whom the directors have the greatest confidence, will go out to Kimberley to superintend its erection. Its entire length is nearly 300 feet.

After the inspection of the plant, the CHAIRMAN (Mr. W. Newman) addressed the visitors, wishing success to the Otto's Kopje Diamond Mines (Limited). He said they might reasonably ask, "What have you done to deserve success?" In the first place they certainly had rescued the company from some questionable surroundings. It was

now thought they had no mine. No sane man would doubt that to-day, for even at the shallow depth of 40 feet there were indications of a satisfactory character, which led them to believe that if it went on increasing in value as depth was attained, their mine was as good as any in Kimberley. As regarded the new machinery—they had not rushed into an experiment. Before Mr. Lisle, their manager, recommended it, he had seen some thousands of loads washed, and they had given a distinct, unvarying average (putting them through a similar plant to the McLelland plant) of exactly 2½ times more than that yielded by the old process. (Applause.)

Mr. F. KARUTH said that the directors had raised the necessary money, and in 6 months had proved the mine. Their average at the present time was better, perhaps, than that of the Jagersfontein Company, who had very big diamonds, but they were working at a depth of 300 feet. Otto's Kopje had only been scratched at the surface—their best diamonds came from a depth of about 40 feet. (Hear, hear.)

A SHAREHOLDER, who said he knew Mr. Lisle well, stated that, as a diamond miner, he was *facile princeps*. Mr. Lisle had the greatest confidence in the property, and believed that the new machinery would enable them to place the company on a paying basis. (Cheers.)

Mr. KARUTH said that they would be able to work more efficiently and at the same time much more economically under the new arrangement. (Hear, hear.)

Mr. BRASH (Chatteris Engineering Works) said that his firm had spared no pains to make this machinery a success. (Applause.)

The proceedings then concluded, and the party soon afterwards returned to London.

## SCANDINAVIA AS A SOURCE OF IRON ORE SUPPLY.\*

By JEREMIAH HEAD, M.Inst.C.E.

SWEDEN and Norway have been known as iron-producing countries for several centuries. Swedish charcoal pig-iron, and Swedish bars of great purity, have long been imported into this and other countries; but, on account of their costliness, they have been used but sparingly, and only for special purposes. This industry still holds its own. Pig-iron to the extent of about 500,000 tons is annually produced at Orebro, Kopparberg, and elsewhere, from about 1,000,000 tons of the rich ores of the Central and Southern Provinces; and the greater part of this is further worked into finished iron and steel. The total number of persons employed in these Swedish industries is about 35,000. A similar trade exists, but to a very small extent, in Norway. When there in 1891, only one blast-furnace remained at work in the whole country, namely, that at Naes, near Grimstad.

But although pigs and bars have long been known as Scandinavian products, iron ore was never regarded as an important article of export until comparatively recent times.

Between 1870 and 1887, the total iron ore exports from Sweden varied from 9485 tons in the former to 41,765 tons in the latter year. Of the 41,765 tons, only 657 tons found their way into the United Kingdom. The same year we received from Norway 2485 tons. The bulk of the Swedish iron ore then exported was from the Grangesberg Mines, situated in the southern part of the peninsula, and was sent to Germany for the manufacture of basic pig iron. In 1887, therefore, the British iron trade was deriving from Scandinavia only about 3000 tons of iron ore.

During the year 1888 Great Britain received from Norway only 720 tons of iron ore, and the imports from that country to the United Kingdom have ever since been quite insignificant. With Sweden, however, the case is altogether different.

In 1888 the total exports rose from 41,765 (the figure for 1887) to 117,530 tons, and those to the United Kingdom from 657 to 62,672 tons. This sudden increase was due to the operations of an English company called the Swedish and Norwegian Railway Company (Limited), which had during the previous year made a railway 132 miles long from the iron ore deposits at Gellivara, in Swedish Lapland, to Lulea, a seaport on the western shore of the Gulf of Bothnia. This company had acquired a concession granted by the Swedish and Norwegian Governments conferring the right to carry a railway right across the peninsula, the total distance authorised being 308½ miles. The concession included also the right to work and export iron ore from the deposits at Gellivara, Kirunavara, Luossavara, and Svappavara, which lay on or near the selected route, at a royalty of from 6d. to 8d. per ton.

Another company, called the Anglo-Scandinavian Steamship Company, closely allied with the railway company, was established to purchase steamers and convey the ore to British and other ports; and a third, called the Magnetic Iron Mountain Smelting Company (Limited), was formed to take on rental and work two blast-furnaces at Walker-on-Tyne, belonging to Messrs. Bell Brothers (Limited). Most of the ore at that time raised was sent to these furnaces to be smelted. The result was, however, disappointing. The pig iron produced contained from 0·3 to 0·6 per cent. of phosphorus, and was, of course, quite unfit for acid steel making. As such pig iron for any other purpose was not largely in demand, and, if it had been, could have been more cheaply produced by a mixture of Cleveland and hematite ores, the Walker enterprise did not result in success. This affected the interests of the allied companies so adversely that they, too, were presently obliged to discontinue operations.

But the Gellivara Mines were found to yield not only such phosphoric ores as were sent to the Tyne, but also from certain of the workings a proportion of ore of exceptionally rich and pure quality. A small cargo of this was ordered by Messrs. W. Whitwell and Co., of Thornaby, and on delivery was found to be so good that the following telegram was sent by them to the sellers:—"We have used your first cargo of Gellivara ore for Siemens and Bessemer steel purposes, and find it both wonderfully pure in analysis and to work easily and most advantageously in the blast-furnace. We anticipate for it a great future. Please send us a further 8000 tons this season." Herr Fried. Krupp, of Essen, also had a trial cargo of 1000 tons. He found it highly satisfactory for steel purposes; it smelted easily, and the consumption of coke was lower than with ordinary steel ores.

But notwithstanding these encouragements, it proved impossible at that time to obtain any considerable quantity of mineral of equal quality with the sample lots; and no more was sent. Indeed, very soon after, Gellivara ores ceased to be exported or raised at all.

As a result of this unfortunate collapse, the imports of Swedish ore in the United Kingdom fell from 62,672 tons in 1888, to 15,427 tons in 1889, 5534 tons in 1890, and to 3108 tons in 1891; and, as far as this country was concerned, the Gellivara Mines might just as well have ceased to exist.

But the Swedish Government did not regard with complacency the total abandonment of the enterprise. The Riksdag and the people generally had never looked with favour on the acquisition of property rights in their country by foreigners. It had been

reluctantly permitted in the present case, in order that the feasibility of the enterprise, of which many Swedes had serious doubts, might be proved at the expense and risk of the more trustful and sanguine British investor. The English company received little or no official encouragement. On the other hand, it encountered much covert opposition, which contributed not a little to the unfortunate result.

Then the Government took over the railway into their own hands, and, after a time, granted very favourable rates to a powerful Swedish company, which forthwith began to work the mines. The English company had made the mistake of mixing, as a rule, the products of the various quarries, thus producing an average quality, which was neither pure enough for acid, nor phosphoric enough for basic processes.

The Swedish company took care to keep separate the products of the various workings, and to grade them according to the phosphorus contained, as periodically ascertained by analysis. They established four grades, A, B, C, and D, grade A, intended for acid processes, containing about 69 per cent. of iron and 0·01 per cent. of phosphorus, and grade D, intended for the basic Bessemer process, containing about 65 per cent. of iron and 1 to 2 per cent. of phosphorus. Ore containing appreciable phosphorus, but not enough to render it unfit for acid purposes, was called grade B, whilst grade C comprised all between that and grade D. The yield of the quarries, of which there are 131, was found to be composed of grades A and B to the extent of 20 per cent., whilst 80 per cent. belonged to the lower grades.

The effect of these improved arrangements soon began to be apparent. The imports of Swedish iron ore into the United Kingdom gradually rose from 3100 tons in 1891 to 13,722 tons in 1892, and 35,601 tons in 1893. Almost all this was of A quality, and was delivered to furnaces in the Cleveland district at prices averaging 18s. per ton. The imports during the present year are expected to reach 130,000 tons.

The general verdict of those who have tried it is that the guaranteed standard of richness and purity has, so far, been well maintained. It is no matter of surprise that much larger quantities have been purchased for the current year. One company alone has contracted for 50,000 tons of A grade; and it is to be noted that grade D has to some extent been used in the manufacture of basic pig ore. That continental iron companies have been still more enterprising than their English competitors in utilising the new source of iron ore supply, will be evident from the statistics of total exports from Sweden. Since 1887, when the Gellivara-Lulea Railway was completed, to December, 1893, the total annual exports have increased by over 400,000 tons, of which 35,000 tons came to the United Kingdom, and the remainder went mostly to Germany and Austria. Inasmuch as in the last named countries the great bulk of the steel manufactured is by the basic process, whereas the exact reverse is the case in Great Britain, it is only natural to expect that what is sent to them should be mainly grade D, and that what is sent over here should be mainly A grade; and this is in accordance with the actual facts of the case.

Grade D, Gellivara ore, is also now extensively used at the large steel works in Upper Silesia. The port of entrance in this, as in the previous case, is Stettin, whence it is forwarded by rail. The Westphalian Works are users of the same grade. It reaches them *via* Rotterdam, some going forward by Rhine navigation, and some by rail. From Rotterdam to Ruhrort by water costs from 1s. 6d. to 2s. per ton. From the same port to Oberhausen by rail costs 2s. 6d., and to Dortmund 3s. 8d. per ton.

I also have information to the effect that grade D is now being offered at about 15s. 6d. per ton, delivered in trucks at Antwerp, for use in the Liege and Luxembourg districts.

It will now be obvious to all that during the last six years Scandinavia has become a most important source of iron ore supply to the principal iron-producing countries of Europe. The ore travels about 1680 miles to English (Cleveland), and 1690 to German (Dortmund) works, and 1400 miles to Witkowitz. This is farther than from the celebrated Lake Superior Mines to the Pennsylvania Steelworks. Only very rich ores could bear such cost for transit.

The value of grade A ore, containing 69 per cent. of iron and 2 per cent. of silica, is at present about 18s. 6d. per ton delivered at Middlesbrough furnaces. Spanish Rubio ore, containing 50 per cent. of iron and 8 per cent. of silica, costs 12s. 6d. per ton, or 6s. per ton less. But the extra 19 per cent. of iron is worth at, say, 5d. per unit, 7s. 11d. per ton, and the 6 per cent. less silica at, say, 1½d. per unit, is worth 9d. per ton. Adding these figures and deducting the 6s., we obtain: 7s. 11d. + 9d. = 6s. = 2s. 8d., as the equivalent of the advantage of grade A over Rubio ore to the extent it is used.

There are certain hematite ores which have been submitted to a washing process to clear them from the matrix in which they are found embedded. The effect of washing is to increase the percentage of all the remaining elements. A sample of washed and dried Rubio ore from the San Salvador Mines, near Santander, analysed for me by Messrs. Pattinson and Stead, contained 59·5 per cent. of iron, 0·038 per cent. of phosphorus, and 1·7 per cent. of silica.

By itself, such an ore could not be used without exceeding in the pig iron the phosphorus limit permissible for acid steel purposes; but by mixing it in the charge with grade A, Gellivara ore, containing, say, only 0·01 per cent. phosphorus, it can be made available and benefit obtained from its high percentage of iron, and from its somewhat lower market value, due to the excess of phosphorus. Rubio ores containing an excess of silica can be utilised in a similar way by mixing with grade A Gellivara, or even with B grade.

For the manufacture of pig iron for acid steel processes, there seems to be no doubt whatever but that a valuable new material has now become available in grade A Gellivara magnetite ore. The large and growing importations into Germany, and the five to six years' experience at Witkowitz, seem also to afford sufficient proof that grade D is equally of value in the manufacture of pig iron intended for the Bessemer basic process as carried on in those countries.

The question remains, how far can we in England use to advantage grade D, with or without our native phosphoric ores, and with or without puddlers' tap, in making pig iron suitable for the Bessemer basic process?

That pig iron made solely or mainly from Cleveland native ores can be turned into good steel in a basic-lined Bessemer converter, the daily practice of Messrs. Bolckow, Vaughan, and Co. (Limited) and others has long ago proved. But that is not the whole question. What is wanted is not only good basic steel, but good basic slag for manure. The by-products are, indeed, as important commercially as the main products, and the market value of them seems to be increasing day by day. The old stock of puddlers' tap containing an average of say 52 per cent. of iron, 17 per cent. of silica, 1·0 per cent. of sulphur, and 3·25 per cent. of phosphorus, are nearly exhausted, and the current output is steadily diminishing. During the 12 years 1892-93, the production of puddle bar in the United Kingdom has decreased by 53 per cent., and in the Cleveland district by 73 per cent. The diminution in the production of puddlers' tap must have been in the same proportion. Will grade D prove a satisfactory substitute? That is a question which time and experience can alone fully determine. But it is clear from analysis (65 per cent. and 1·353) that it promises well as a source of iron and phosphorus, without the drawbacks of high silica and sulphur (2·05

\* Abstract of a paper read recently before the Iron and Steel Institute, by J. Jeremiah Head, M.Inst.C.E., London.



and 0.88). Much depends on the price at which it can be delivered.

The Gellivara deposits are 4 to 5 miles long by 1 to 2 miles broad. The ore in sight, or which can be detected by the dip-needle, covers an area of 160 acres. Borings have been made to a depth of 175 feet without reaching the bottom. The quantity of ore has not been determined, but there is no doubt that it is enormous; indeed, enough to supply all probable demands for several generations.

As a material for the manufacture of pig iron for acid steel purposes, there is obviously an advantage in the use of grade A ore at present prices. But the market value of such pig iron is now about 9s. per ton more than that of Cleveland or of Cleveland-basis pig iron. The puddler's tap, which forms so important an ingredient in the last-named commodity, is selling at about 6s. 6d. per ton delivered to smelters. For a time, at least, this will have to be taken into account in determining the value of grade D, and deciding whether it can be profitably imported into this country.

A similar question arises in respect of grade C as a material for use in the production of ordinary Cleveland pig iron for forge and foundry purposes. Will it displace native ore partially or entirely? The cost of the calcined Cleveland ironstone necessary for the production of a ton of Cleveland pig iron is about 15s. If this were displaced by Gellivara ore yielding 65 per cent. of iron, 1½ tons would obviously be required. At the same total cost—viz., 15s. per ton of pig produced, this would admit of the price of two-thirds of 15s., or 10s. per ton of ore delivered to the furnaces, being paid for it. Can grade C be delivered to Cleveland furnaces for 10s. per ton, or any near approximation thereto?

According to custom-house returns the lowest average value of iron ore imported from Sweden into the United Kingdom since 1888 is 16s. per ton. Mr. J. T. Smith, who visited Gellivara in 1888, considered that when the output reached 1,500,000 tons per annum the cost of raising, conveying, and putting f.o.b. at Lulea would not exceed 5s. 6d. per ton, including royalty and some other charges. But as the output has not yet reached one-third of that quantity, and as all charges have not been included, we may, I think, fairly increase his estimate to say 6s. 6d. per ton. Taking the cost of railway freight at only ½d. per ton per mile—a cost which, under favourable conditions, is said to be realised in America—then 132-3 = 44d. = 3s. 8d. per ton for railway dues, leaving 2s. 4d. per ton for getting, breaking, hand-picking, wheeling, loading, putting f.o.b. at Lulea, interest and superintendence, and 6d. per ton for royalty. A total cost price of 6s. 6d. per ton f.o.b. Lulea is at all events not too high an estimate. From Bilbao, which is 1080 miles from Middlesbrough, the present rate of sea-freight for conveyance of ore is about 5s. 3d. per ton. In view of the fact that Lulea is 1550 miles, or fully 1½ times as far, and that, on account of ice, the traffic has to be done during five months only of the year, I think that an additional 1s. 3d., or a total of 6s. 6d. per ton, is not too high an estimate for the average freight from thence. This brings the lowest cost price of Gellivara ore to 6s. 6s. + 6s. 6d., or 13s. per ton delivered in Cleveland, without reckoning any profit to producers.

Comparing this figure with 10s. per ton, which we have just found to be about as much as can at present be expected for grade C, it seems probable that grades A and B, and perhaps D, will alone reach us in quantity, so long as Lulea, with its disadvantages of distance and seven months of ice, is the port of shipment. Certainly Germany and Austria are taking large quantities of grade D in spite of all difficulties, but the protective tariffs of those countries enable the finished iron and steel they produce to be sold, in the home markets at all events, at prices which cannot be obtained by English makers, and those higher prices may justify the importation of relatively dear materials.

These conditions were by no means ignored by the original Swedish and Norwegian Railway Company. Their concession, which was first obtained in 1883, authorised them to continue their line through to Victorihavn, on the Ofoten fiord. That fiord, and, indeed, the whole of the west coast of Norway, is always free from ice, however severe the winter. This is due to the fact that it lies in the path of the Gulf Stream, and of the warm winds which are continually moving from the tropics to the polar regions.

Owing to the early collapse of the English company, the railway was never carried through to Victorihavn. The advisability of completing it is still under contemplation by the Swedish Government; but, as in the case of our own Channel Tunnel, military apprehensiveness has, so far, overridden commercial considerations.

Relatively to Germany and Austria, England, and especially the Cleveland district, will secure the greatest advantage by the opening out of the Victorihavn route. The average sea-freight is, however, scarcely likely to be reduced more than 1s. per ton, or from 6s. 6d. per ton from Lulea to 5s. 6d. per ton from Victorihavn. There is, therefore, little prospect of Swedish ore of any kind being delivered to Middlesbrough, even via Victorihavn, at less than 13s. minus 1s., or say 12s. per ton; and this, as we have seen, is a higher price than can be expected at present for any kind except grades A and B, and perhaps D.

In this minimum cost price of 12s. per ton, delivered at Middlesbrough, I have included 3s. 2d. per ton for railway carriage for the 115 miles from Kirunavara to Victorihavn. It is obvious that if this item could be saved by the discovery of iron ore deposits, similar to those on the route of the Swedish-Norwegian Railway, but situated on or near the always accessible Norwegian fiords, such a discovery might bring down the cost price to 12s. minus 3s. 2d., or say 8d. 10d. per ton at Middlesbrough. Again, if such deposits were situated farther south than Victorihavn, the freight also might be lower in proportion. Indeed, a cost price of 8s. per ton delivered might, under such circumstances, be easily arrived at.

The careful and elaborate surveys of the Gellivara and the three neighbouring deposits which were made in 1875 by a Commission of experts sent for the purpose by the Swedish Government, seem to have established the following facts, viz.—1. That the ore is all more or less magnetic, the metallic iron contained being in the condition of protoxide, peroxide, or magnetic oxide, or a combination of these oxides. 2. That it is found in lodes or veins, which, together with the bed rocks in which they lie, appear to have had an intrusive origin, and are usually more or less distorted. 3. That the lodes are associated with gneiss, quartz, feldspar, granite, hornblende, and mica schist. Corundum, fluorapatite, calcspar, actinolite, adamantine, asbestos, epidote, and garnets are also found in or about them. 4. That the phosphorus is in the form of apatite (Ca<sub>2</sub>PO<sub>4</sub>), and can, to a great extent, be separated by hand-picking. 5. That ore sufficiently free from phosphorus for acid steel purposes is but a portion, say, one-fifth, of the whole. 6. That the deposits generally protrude at the surface of the mountains, where they are easily distinguishable from a considerable distance by their dark colour. The ore in sight or traceable by the dip-needle constitutes usually about 5 per cent. of the total surface area of the deposits. 7. That the more elevated and more outlying portions of the deposits yield, as a rule, ore containing less iron and more impurities than the less elevated and more central portions; and that samples taken from the interior of the lodes give better analyses than those taken from near the surface.

On this point Herr Gumelius, of the Royal Swedish Geological Bureau, and a member of the Exploratory Commission, says with respect to Gellivara: "The principal part of the ore, lying in the middle of the deposit, may be considered free from phosphorus, and this rather at its present depth than nearer the surface." Again, when referring to Kirunavara, he says: "The highest peak shows most phosphorus. From the middle peaks the percentage decreases on both sides steadily till one gets ores almost pure. We are fairly entitled to presume that the percentage of phosphorus decreases with the depth. But one is not justified in drawing definite conclusions on this point without actual quarrying."

Herr Dellvik, of the Royal Swedish Iron Board, another member of the Commission, says of Gellivara: "At one place where there is a shaft 18 feet deep, the samples taken from the top contained 374 per cent. of phosphorus, and those drawn from the bottom only 331 per cent. This interesting result leads to the opinion that apatite may everywhere diminish with depth of working."

Let me now remind you of my remark, that if any considerable deposits similar to those we have been considering should be found on the west coast of Norway, such a discovery might have a still more important influence on the future of the iron and steel trades, especially those of Cleveland. For such ores, emanating from those always accessible fiords, should not cost more than 8s. per ton (exclusive of profit) delivered at Middlesbrough. But are there any such deposits on or near the Norwegian fiords? That is a question which I do not think any one can conclusively answer at present. Many deposits are known to exist, and some of them are of great extent. But no definite and systematic search has, so far as I know, ever been made. In various places where protruding ore has been found, concessions have been granted. But the native concessionaires generally lack the means to develop, or even to prove their properties. Unlike the Swedes, they are anxious enough for Englishmen to come with capital and skill to buy and work their concessions. But the enterprising capitalist naturally demands that the value of a mining property shall be proved to his satisfaction before he sinks good money in its acquisition. This the native concessionaire usually cannot do for want of funds; and so the mining wealth of Norway, with its unusual advantages of position, remains to this day, to a great extent, undetermined, and almost entirely unutilised.

In the summer of 1891 I visited several magnetic iron ore deposits in the neighbourhood of Grimstad and Arendal, on the south coast of Norway. The ore seemed to lie in nearly vertical lodes or veins of variable thickness. In former times, several of them had been extensively worked, as testified by the pits, headings, heaps of bed rock and ore, and even remains of winding apparatus still to be seen. Many of these deposits have been partially or entirely exhausted, and are now full of water; and I found it difficult to obtain even samples of ore *in situ*. Other deposits of similar character had not yet been worked at all, and were traceable only by occasional holes, and by the indications of the dip needle.

Near Sogndal, between Christiansand and Stavanger, is the titaniferous iron ore deposit, formerly worked by the Titanic Iron Company (Limited), but now inactive. It is a mile and a half long, and 60 to 70 yards thick. There is a similar deposit near Ekersund, 3 miles long, and 2 to 12 yards thick.

To the north of Trondhjem is a vein of magnetite 11 yards thick and of unknown length. The specimen on the table marked Trondhjem W. is from this deposit. I regret that I am unable to give an analysis.

In June, 1893, I again visited the west coast of Norway, passing from Bergen to the Lofoten Islands and back to Stavanger. I explored one mountain situated alongside of a deep water fiord somewhat further to the north of Trondhjem, in which magnetite ore was protruding at various points, and which I estimated to contain not less than 25 millions of tons, or enough for an extensive export trade for a couple of generations at least. This deposit has, so far as can be seen, all the outward characteristics of that of Gellivara. Its position is everything which could be desired for cheap working and exporting, and if efficient enterprise and means were forthcoming to prove it thoroughly, it might come to fulfil very sanguine expectations.

Not far from this deposit is another of similar character, which I call Trondhjem Y. It is 16 miles long by 44 yards broad. Its depth is unknown. One end of the deposit is within 12 miles of a small seaport situated at the head of a fiord. The bed rocks are igneous and metamorphic, and generally similar to those of the Swedish deposits. Still farther to the north are other deposits of magnetic and specular ore, which I call Trondhjem Z. Specimens taken from them yielded 64 per cent. of iron, 0.02 to 0.09 of phosphorus, and 0.01 to 0.03 of sulphur. In one of the Lofoten Islands I examined several detached deposits. The specimens I selected yielded on analysis 61 per cent. of iron and only traces of phosphorus; but they contained no less than 9.2 per cent. of titanic acid. The deposits do not appear ever to have been worked, although within a quarter of a mile of a good navigable fiord.

Scandinavian magnetite ores if used alone have usually been found extremely difficult to smelt, and this has been supposed to be due to the influence of the titanic acid contained in them. But if, as Mr. C. Wood has pointed out, they be smelted, not alone, but in combination with other and poorer ores, especially such as contain alumina, this refractoriness seems entirely to disappear. Certainly Messrs. Kupelwieser, Whitwell, and Walter Wood agree that they have met with no difficulty of that nature. This will be a matter of no small importance should Scandinavian ores come to be purchased at a cheap rate, and used in Cleveland in combination with native ironstone for the manufacturing of basic and ordinary pig iron.

In the course of the discussion on the paper by Mr. Kupelwieser, read at Darlington, I called attention to Sweden and Norway as possessing almost unlimited supplies of iron ore, and to the fact that these might prove of the utmost service to the iron and steel industry generally, and especially that of Great Britain, which is so well situated for importing them. My revered friend, Sir Lowthian Bell, who, I think, must have had in his mind the central and southern mining districts of Sweden only, then dissented from what he termed my "sanguine hopes." I trust I have now succeeded in convincing him and you that the question is not one of hopes only, but also of accomplished facts—facts, of great significance, and which we certainly cannot afford to ignore.

I think also that we who are interested in the British iron, steel, and engineering trades ought to keep in our minds more than we are accustomed to do, the precarious position we have placed ourselves in by depending so exclusively on one foreign country for steel-making ores. Twenty-five years ago, our ships, bridges, boilers, and railway-tracks were made of iron derived almost entirely from British ores. Now almost all these are made of steel derived from Spanish ores. What will happen if the Spanish Government lays a heavy export tax upon ore, or if the trade with that country be impeded by war, or even rumours of war, or by the exhaustion of the Bilbao deposits, is not pleasant to think of. At all events, we should be in an infinitely more sound and safe position if we had another string to our bow, in the way of a well-established traffic in ores adapted for basic as well as for acid processes, with our friends and kinsmen the Norsemen of Scandinavia.

## LATEST FROM THE MINES.

### CABLEGRAMS AND TELEGRAMS.

**AURORA WEST.**—April results: 28 days, 30 stamps, 1110 ounces, 2900 tons. Cyanide works will follow later.

**BARRETT GOLD.**—The manager, writing 12th April, explains the low return of 300 ounces in March as being due to continuous rains and floods. Alterations and additions to the cyanide works would, he considered, also adversely affect the April returns, but rapid progress was being made with the new plant, and all would probably be finished and at work by about the end of May. The mine was looking well, and Homeward Bound Extension Reef opening up much better than hitherto. A cablegram from the mine just received gives the April yield, 330 ounces.

**BURMA RUBY.**—The result of the mining for the six weeks ended April 30, was 6150 loads washed, producing rubies valued at 18,000 rupees, or an average of 3s. 8d. per load.

**BLOCK B LANGLAAGTE ESTATE.**—Production for April (by cable): "Mill: Ore crushed, 5650 tons of 2000 lbs.; gold returned, 1746 ounces.—Tailings, cyanide process: Tons treated, 6450 tons of 2000 lbs.; gold recovered, 843 ounces.—Concentrates, cyanide process: Tons treated, 116 tons of 2000 lbs.; gold recovered, 197 ounces. Total gold recovered 2786 ounces."

**BAYLEY'S REWARD.**—The following cable, dated 5th inst., has been received from Melbourne by the London office: "The 220 feet level has been extended west. There are 12,000 gallons of water per 24 hours."

**BUFFLESDOORN.**—Result of last month's crushing 7113 tons, yielded 2672 ounces of gold, and 6500 tons treated by cyanide process yielded 1400 ounces of gold.

**CROWN REEF.**—Results for April: Yield in smelted gold from 120 stamps mill 7344 ounces, yield in smelted gold from 120 stamps cyanide works treating tailings and concentrates produced by the mill 2890 ounces; yield in smelted gold from old cyanide works treating accumulated stock of tailings and slimes, 1819 ounces; total, 12,053 ounces.

**CAYLLOMA.**—A cable message has been received from the manager reporting April production 10,750 ounces fine in ores shipped, and 10,500 ounces fine in bullion, adding, mine not yet free of water.

**CENTRAL MONTROSE.**—1200 tons of quartz crushed yielded 520 ounces.

**DE LAMAR.**—Captain Plummer cables that the whole mill (30 stamps) will be in full operation again to-day the 11th inst.

**EAST RAND PROPRIETARY.**—The Anglo-French Exploration Company, as agents for the above company, are in receipt of the following cable from Johannesburg in reference to the 10-stamp mill, which has been erected and started crushing last month: "During the month the New Blue Sky 10-stamp mill crushed 928 tons, which yielded 515 ounces—10 tons of concentrates to the value of 60 ounces. The assay of the tailings being 7½ dwts., making a total of 20 dwts. to the ton."

**EXPLORATION.**—Alaska Mexican Gold Mining Company: Cablegram from Alaska reports the clean-up for the month of April as follows: "Period since last return, 30 days; bullion shipped, \$13,970; ore milled, 5321 tons; sulphurets treated, 112 tons; of bullion there came from sulphurets, \$3252; working expenses for period, \$13,535."

**ELKHORN.**—The following is the cabled return for the month of April: "Mill worked 28 days and crushed 1112 tons. Bullion produced in the mill, \$23,286; 180 tons of smelting ore sold, \$14,094; total produce, \$37,380; total expenses \$22,060; estimated profit for the month \$15,300, or at \$4.85 to £ sterling, £3154."

**FORBES REEF.**—A telegram has been received from the mines stating that the result for the month of April is 165 ounces of gold.

**FERREIRA.**—Copy cablegram received from Johannesburg: Results for April: Tons crushed, 3963; bar gold extracted, 4086 ounces; concentrates caught, 130 tons; assay value of concentrates, 6 ounces 12 dwts. 8 grains fine gold per ton. Cyanide works: Bullion produced from tailings, 1110 ounces."

**GEORGE AND MAY.**—Crushing for April, 1894, 1023 ounces, 3323 tons.

**GELDENHUIS MAIN REEF.**—During April 465 ounces of gold were obtained from cyanide and 840 ounces from mill.

**GINSBERG.**—Result of April crushing is as follows:—"945 tons crushed, yielding 631 ounces of gold."

**GLENCAIRN MAIN REEF.**—production for April, 3953 ounces.

**GEORGE GOCH.**—The directors have received a cablegram from Johannesburg, giving the result of working during April as follows:—"5476 tons crushed, 1428 ounces won, and 216 ounces from concentrates, 50 stamps working 27 days."

**GUADALCAZAR QUICKSILVER.**—The quantity of quicksilver drawn off during the week ending May 3, including clean-up of 1450 lbs., as cabled from the mines, amounts to 4150 lbs., equal to 55½ flasks.

**GELDENHUIS ESTATE AND GOLD.**—A cablegram has been received from the head office at Johannesburg, stating the following results for last month (April):—"Crushed 9100 tons, obtained 3530 ounces of gold; profit for month £2100."

**HARQUAHALA.**—The following is the cabled estimate return for the month of April:—"Crushed during the month, 2600 tons; estimated gross value of gold produced, \$32,000; miscellaneous revenue, \$500; total, \$32,500; estimated total expenses, \$12,100; estimated profit for the month, \$20,400; at \$4.90 to £ sterling £4163."

**JUMPERS.**—A cablegram has been received from the head office at Johannesburg, stating the following results for last month (April):—"Crushed 7910 tons, obtained 4119 ounces of gold, and concentrates equal to 636 ounces of gold, total 4755 ounces of gold; profit £6250."

**JUBILEE.**—Result of last month's crushing, 3147 tons yielded 1708 ounces of gold, and from tailings 350 ounces of gold.

**KABOONGA.**—The following cablegram has been received from the manager at the mine:—"Rise 38 feet south-east drive 1280 feet; appearances are favourable."

**LANGLAAGTE ESTATE.**—Production for April, 1894: By cable: "Mill: Stamps running, 160; ore crushed, 21,245 tons of 2000 lbs.; gold returned, 7302 ounces.—Tailings, Cyanide Process: Tons treated, 26,400 tons of 2000 lbs.; gold recovered, 4696 ounces.—Concentrates, Cyanide Process: Tons treated, 425 tons of 2000 lbs.; gold recovered, 1005 ounces. Total gold recovered, 13,003 ounces."

**LAS CABESSES MANGANESE.**—Production for the week ending 5th May (five working days, 1st of May being a holiday) 334 tons, being a daily average of 66.8 tons.



**LANGLAAGTE ROYAL.**—Production for April 4015 ounces. Net profit £5400.

**METROPOLITAN GOLD.**—During April crushed 2195 tons, obtained 770 ounces of gold.

**MEYER AND CHARLTON.**—Crushed during April 3730 tons, obtained 2213 ounces of gold, 738 ounces also recovered from tailings; total, 2951 ounces; estimated profit, £4139.

**MONTANA.**—The secretary states that, by cablegram from the mine, the directors are informed that the total output for April was—Gold, 2510 ounces; and silver, 24,010 ounces; and that the estimated realisable value of the same was \$64,100. The tonnage of ore milled during the month was 5347 tons, 100 stamps having been in operation. The expenditure was as follows:—Working expenses on revenue account, \$30,700; outlay on developments, \$13,300; extraneous expenses, including insurance, \$2850; on permanent improvements account, \$100= \$16,250. Total, \$46,950. Mr. R. T. Bayliss is expected in England the latter end of this month. The half-yearly meeting, of which due notice will be given, will be held as soon after his arrival as possible.

**MOSMAN.**—The directors have received the following cablegram from the manager at Charters Towers:—"Have crushed during the fortnight 269 tons of stone from the Wyndham shaft for 123 ounces of gold. The expenses of both the North Australian and the Wyndham Mines for the fortnight are £960. I estimate the value of quartz at grass upon which mining expenses have been paid at £1500. The estimated value of the above return is £425."

**MOUNT SHAMROCK.**—The manager cables:—"The cross-cut from the 350 feet level has been driven a distance of 113 feet north-west. The developments show signs of improvement, and are following distinct mineral veins. There is a very good prospect of finding ore."

**MOUNT ZEEHAN (Tasmania).**—The following telegram has been received from Hobart, dated 8th inst.:—"Have treated during past fortnight 325 tons of ore, yielding 65 tons concentrates, containing about 48 tons 15 cwt. of lead, and 4875 ounces of silver."

**MOODIE'S.**—Returns for month of April: Claims rented or leased from the company, 251; number of tons crushed by claim-holders, 550; yield of gold from ditto, 613 ounces.

**MYMORE.**—The directors have received a telegram from Mr. Hancock giving the return of gold for the month of April as follows: "4628 tons of quartz produced 3461 ounces, and 723 ounces were obtained from tailings, making together a total of 4184 ounces of gold."

**MAY CONSOLIDATED.**—The following cable message, dated Johannesburg, 4th inst., has been received at this office: "The yield of gold during the past month (April) was 2052 ounces from 5500 tons crushed. Mill running 29 days."

**MAIN REEF.**—During April crushed 3755 tons, obtained 1235 ounces of gold, also 515 ounces from tailings, total 1750 ounces.

**MESQUITAL DEL ORO.**—The following cablegram, giving the result of the April mill run, has been received from the mine:—"50 stamps ran 763 hours (31 days 19 hours); quantity of ore crushed 3563 tons; bullion produced at clean-up 1222 ounces; value about £4360. Have also remitted copper bar, value about £68."

**NEW GUSTON.**—The directors have received the following cable information from the mine, viz.:—"New Guston Mine, No. 11 level: Splendid body of ore; entered the distance of 6 feet. The ore still continues compact, very solid. Assays average \$23 per ton of 2000 lbs."

**NEW RIETFOONTEIN ESTATE.**—Crushed during April 2306 tons, obtained 903 ounces of gold; cyanide works treated 204 tons of tailings, yielding 576 ounces from concentrates 89 ounces; total, 1583 ounces. The decrease is owing to low grade ore crushed from east mine. 30 stamps are now running, being an increase of 5 stamps.

**NEW SPES BONA.**—A cable to hand advises the result of 25 days' milling with 50 stamps was 4879 tons crushed, yielding 1209 ounces smelted gold, and 3550 tons tailings treated yielding 700 ounces gold. Total, 1809 ounces gold. The total production for March was 1936 ounces. The directors regret to say that the estimates of result set out in Mr. Bennett's report on the mine of 20th October last have so far not been realised, the expenditure on capital account having greatly exceeded the funds available. The local board have now cabled that they require financial assistance to the extent of £10,000 to meet liabilities. The local board had anticipated from month to month that they would be able to meet these gradually accruing liabilities, by shortly realising their anticipations as to profit, and written reports up to 30th March—received here as late as 21st April—continued satisfactory. The directors are now considering how this financial requirement can best be met. By cable advice has been received that the manager's annual report for 1893 would be forwarded by mail of 7th May; upon its receipt it will be published to the shareholders, and the annual general meeting will be called.

**NEW HERIOT GOLD.**—Last month's crushing yielded 3841 ounces.

**NEW PRIMROSE.**—Production for April: 6803 ounces; 100 stamps running 29 days; profit, £8236.

**NEW CLEWER ESTATE.**—Results for April: From mill working 26 days, crushed 1809 tons, yielding 691 ounces of gold; from cyanide works, treated 2400 tons, yielding 1163 ounces of gold; total yield, 1854 ounces of gold; total value, £5168.

**NUNDYDROOG.**—The directors have received a telegram from Mr. F. W. Grey giving the return of gold for the month of April as follows: "2380 tons of quartz produced 1497 ounces, also 125 ounces were obtained from tailings, making together a total of 1622 ounces."

**NIGEL.**—Last month's crushing yielded 2008 ounces from battery, 1560 ounces from cyanide.

**NEW CHIMES.**—Result of last month's crushing yielded 2487 ounces of gold.

**PAARL CENTRAL.**—A cablegram has been received from the head office at Johannesburg, stating the following results for last month (April):—"Mill: Crushed 4218 tons, yielding 1817 ounces of gold.—Cyanide Works: Treated 2730 tons, yielding 764 ounces of gold, equal to 2581 ounces of gold; total value, £2800."

**PALMAREJO.**—Return for April: Mill worked 22 days, worked 1200 tons, producing \$40,500, expenses for the month \$29,000.

**QUEENSLAND SMELTING.**—The manager cables:—"Have shipped bullion to the value of £12,000 per a.s. Echuca."

**RANDFONTEIN ESTATES.**—Production for April, 1894: By cable: "Mill: Ore crushed, 6670 tons of 2000 lbs.; gold returned, 3175 ounces.—Tailings, Cyanide Process: Tons treated, 3290 tons of 2000 lbs.; gold recovered, 455 ounces. Total gold recovered, 3630 ounces."

**SALISBURY.**—Last month's crushing yielded 1500 ounces.

**ROBINSON.**—Production for April (by cable): "Mill: 70 stamps at work, 8890 tons of ore crushed; yielded in smelted gold, 10,018 ounces; from concentrates (by chlorination), 1132 ounces; from tailings (cyanide process), 1223 ounces; from own ore, 12,373 ounces; from concentrates bought (by chlorination), 2310 ounces; total gold recovered, 14,683 ounces."

**STANHOPE.**—Last month's crushing yielded 970 ounces battery, 456 ounces cyanide; total, 1426 ounces. Tons crushed, 1800. Approximate expenses, £2750; approximate profits, £2000.

**VILLAGE MAIN REEF.**—Result of last month's crushing Mill ran 27 days, crushed 3300 tons, which yielded 2800 ounces free gold and 82 tons concentrates, assaying 3 ounces. Tailings assayed 4 dwts.

**VICTORIA GOLD (Charters Towers).**—The directors have received the following by cable:—"235 tons crushed, yielded 365 ounces gold for 2 weeks."

**VICTORY (Charters Towers).**—The London office has received the following cablegram from the company's head offices in Sydney, dated May 10:—"Accounts are more favourable. Workings are looking much better. We are now crushing better ore.—Arrange for official quotation on London Stock Exchange."

**WOLHUTER.**—Crushing for April: 1820 ounces, 3440 tons, 710 ounces tailings, total 2530 ounces.

**WEMMER.**—The directors are in receipt of cablegram from Johannesburg advising work done during April:—"4168 tons crushed, yielding 3058 ounces of gold, 40 stamps working 29 days."

**WORCESTER EXPLORATION.**—The result of last month's crushing yielded 2700 ounces of gold.

## COMPANIES AND THEIR DOINGS.

Reports, Balance Sheets, Dividends, &c., of Mining, Railway, Banking, and other Companies.

### MINING COMPANIES.

#### The Sheba Gold Mining Company.

The following circular has been issued to the shareholders of the Sheba Gold Mining Company:—"At the commencement of February the board received a cable reporting 'the discovery of a good body of pay ore, 90 feet thick, north of Edwin Bray,' and, therefore, presumably in Annie's Fortune, one of the sets of claims purchased from the Oriental Company. In course of post this information was confirmed by letter, when the board learnt of the likelihood of the shoot passing from the Annie's Fortune claims down and into the Edwin Bray claims, and thence into the Golden Quarry Deep Level. Between these two periods of time the board purchased, subject to the approval of the Edwin Bray shareholders, the Edwin Bray claims for the same consideration as was originally asked at the time when the Sheba Company was negotiating for the purchase of the Oriental Company and its allied deep levels. This consideration was \$5,000 Sheba shares, or the equivalent in cash, at the option of the vendors. The option has been finally settled as follows, namely, 9634 Sheba shares, and £26,580 in cash in lieu of 25,316 Sheba shares. The contract was finally settled only this day. Pieces of rock containing visible gold have been found in Annie's Fortune; and from 90 feet to 100 feet across the reef, the quartz appears to be precisely the same as the original Sheba quarry ore. It has been decided to open up the ground, and to transport the quartz by a short line of aerial tram which has been erected. We are advised by cable that it was intended to start crushing from Annie's Fortune on 5th instant."

#### Waihi Gold Mining Company (Limited).

The following circular has been issued to the shareholders:—"The directors have just received the following telegram from Auckland:—"50 feet north of the present lode we have struck main lode. Further particulars will be sent as soon as possible." On the 16th ultimo the directors received telegraphic advice in reply to enquiry from London that the lode which was unexpectedly cut on the 21st February (of which the shareholders were advised) had proved to be the main lode, and that it had been driven on for a distance of 70 feet westwards, and was about 20 feet in width. This was duly advised to the shareholders. From the foregoing telegram, however, it would appear that the lode then cut was not the main lode, but another lode of considerable width and value, and that the main lode has just been reached 50 feet north of the present lode. Two lodes, therefore, appear to have been cut in the lower levels. The directors think it right to at once send this information to the shareholders, and when the further particulars promised are forthcoming they will be duly communicated."

#### May Consolidated Gold Mining Company (Limited).

The directors' report for March:—"Mined, 5300 tons; ore at grass, 4021 tons; 50 stamps, running 27 days 12 hours, milled 5300 tons; yield in smelted gold, 2065 ounces; average yield per ton, 7.79 dwts.; average crushed per stamp per day, 3.85 tons; value of gold won (say), £7485 12s. 6d. Expenditure: Mining and raising 5300 tons cost £3728 15s. 7d., equals 14s. 0.85d. per ton; tramming, £292 6s. 6d., equals 1s. 1.23d. per ton; milling, &c., £1500 8s. 6d., equals 5s. 8.35d. per ton; development, £1397 10s. 11d., equals 5s. 3.34d. per ton; total, £6928 1s. 6d., equals £1 6s. 1.77d. per ton. Expended on construction, £1303 6s. 11d. Total expenditure, £8231 8s. 5d. Result: Gold won, valued at £7485 12s. 6d.; expended (less construction), £6928 1s. 6d.; net profit for month, £557 11s."

—The secretary of the ISLE OF MAN MINING COMPANY (LIMITED) sold on Saturday last, 100 tons of the company's ore at £6 18s. 6d. per ton.

—The certificates for the bonus of 100 per cent. in fully paid shares in Guy Fawkes Reef are being posted to the shareholders in PARDY'S MOZAMBIQUE SYNDICATE (Limited).

—The CHAMPION REEF GOLD MINING COMPANY OF INDIA (LIMITED) has sold the gold produced in March for £12,397 17s. 5d.

—Letters of allotment in MAWSON'S REWARD CLAIM (LIMITED) have been posted. The Western Australian Bank are opening branches at Perth and Coolgardie. To facilitate the development of these districts a gold crushing company has been formed at Coolgardie, the directors of which include the Hon. Sir George Shenton, President of the Legislative Council of Western Australia; the Hon. H. W. Venn, Commissioner of Railways and Director of Public Works, and two directors of the West Australian Gold Fields.

—The MYSORE GOLD MINING COMPANY (LIMITED) has sold the gold obtained during the month of March, which realised £15,616 4s. 7d.

—The NUNDYDROOG COMPANY (LIMITED) has sold the gold obtained during the month of March, which realised £6572 11s. 3d.

## GOLD IN FINLAND.

(Translated from the Berg-und-Hüttenwesen.)

IN the year 1891 the gold production decreased in round numbers about one-half in comparison with the previous year, or from 17,860 grams to 8768 grams, to the value of 28,057 francs. At that time 101 workmen were employed in washing, and it is calculated that, after allowing for the cost of transport, the insurance and realisation of the gold, the profit amounted, during the three summer months, to 270 francs, or 3 francs daily. Certain superintendents who take no part in the work do not now exist upon the washings; they are not wanted, neither can they be supported. The gold in the Ivalo Valley, in the Lappmark and its tributaries, seems to fall off according to all reports and working results; the best strata are exhausted, and no new ones are discovered, or are so poor as not to be worth working. That it would come to this was anticipated some time ago, for the gold was found only along the stream in its most rapid and wildest parts, where it appeared in very small streaks [Streifen]. These bank streaks, some 10 metres wide, are soon exhausted. As at the mouth of the river, the soil carries no gold, the metal must, therefore, yearly diminish. Worked with economy, as in the last years, the washing operations in the Lappmark may probably last some time, especially taking into consideration that it affords a means of living to the poor population in the neighbourhood.

## TIN TICKETING.

TICKETING for tin ores was held at Redruth, on Tuesday, with the following result:—

VALUES OF ORES SOLD BY EACH MINE.			
	Tons cwt.	Per ton.	Value.
Carn Brea No. 1.....	16 0	£38 18 0	£616 0 0
do No. 1a.....	15 0	38 15 0	581 5 0
do No. 1b.....	15 0	38 10 0	577 10 0
do No. 2.....	2 0	30 12 6	61 5 0
Dolcoath No. 1.....	15 0	43 17 6	658 2 6
do No. 1a.....	15 0	44 2 6	661 17 6
do No. 1b.....	15 0	42 2 6	661 17 6
Tincroft.....	16 0	39 15 0	636 0 0
do.....	16 0	40 0 0	640 0 0
do.....	3 0	25 7 6	76 2 6
South Frances Ltd. No. 1.....	16 0	43 0 0	688 0 0
do No. 1a.....	16 0	43 7 6	694 0 0
Wheal Grenville No. 1.....	30 0	45 0 0	1350 0 0
East Pool No. 1.....	17 0	39 7 6	669 7 6
do No. 2.....	2 0	19 10 0	39 0 0
Phoenix United No. 1.....	18 0	43 12 6	785 5 0
Wheal Bassett No. 1.....	14 0	45 2 6	631 15 0
do No. 2.....	3 0	35 15 0	107 0 0
Killifreth.....	12 0	42 10 0	510 0 0
West Kitty.....	12 0	45 12 6	547 10 0
Weal Agar.....	10 0	40 5 0	402 10 0
South Condarrow.....	8 0	45 15 0	366 0 0
Wheal Kitty.....	6 0	45 12 6	273 15 0
Hexworthy Tin Co.....	4 0	47 17 6	191 10 0
Park of Mines.....	3 0	47 12 6	142 17 6
	299 0		£12,568 15 0

### AVERAGE PRICES PER TON.

January 30.....	£41 10 1	March 21.....	£41 15 6
February 13.....	40 10 11	April 10.....	41 11 8
February 27.....	39 3 8	April 24.....	40 12 3
March 13.....	40 8 11	May 8.....	42 0 8

**EARL'S COURT EXHIBITION.**—The Industrial Exhibition at Earl's Court was opened on Saturday by the Right Hon. the Lord Mayor, who was accompanied by the Lady Mayoress. The opening ceremony in the central hall was followed by luncheon, at which Mr. H. Percy Dodson, the managing director of the exhibition, in proposing the health of the Lord Mayor, pointed out that it augured well for the success of an industrial exhibition that the official head of the greatest trading city in the world should lend his support to an undertaking which had for its object the representation of industrial arts and crafts amid enjoyable surroundings. He expressed the hope that the many objects brought together there would be of service to the thoughtful man, who after his labours would be enabled to enjoy the music and healthful amusements provided in the beautiful grounds.—Sir Charles Tupper, the High Commissioner of Canada, also spoke in appropriate terms of the benefits, which should accrue from such an exhibition. The exhibition is intended to illustrate in a practical form each of the manufacturing and industrial processes and products of Great Britain as can be properly and advantageously included in a popular display, and when finished will afford a fair indication of the advances made in methods of production during the past few years. It will also show in what direction the inventor has made the greatest progress. The industrial exhibits have been divided into seven special groups, and each group into several classes, there being, in all, 37 distinct classes, embracing furniture and decorative objects, heating and cooking apparatus, articles of personal adornment, bookbinding, colour printing, &c. A military tournament is promised as an additional attraction, and, with numerous flower shows and other special features introduced from time to time, the Earl's Court Exhibition should not fail to obtain popularity.

**TERRIBLE ACCIDENT IN A FIFE COLLIERY.**—An accident occurred, on Tuesday, in the Aitken Pit at Killybeg Colliery, Dunfermline, belonging to the Fife Coal Company, by which three men were killed and a fourth narrowly escaped with his life. The Aitken pit is in process of sinking, and a shift of eight men started in the shaft at six yesterday morning. At half-past 10 o'clock, four of them were drawn up the shaft, while the other four continued at work at a depth of 40 fathoms. Four shots were got ready and charged with gelatine, and the four men got into the kettle to be drawn up the shaft to the surface. The men had only got 10 fathoms up the shaft when one of the men happened to strike the wood work, and the kettle tilted from side to side. It ultimately struck with great violence against the side of the shaft, with the result that three of the men, named Charles Clarke, Leven, David Graham, Kilsyth, and Thomas Wood, Oakfield, were thrown out, and fell to the bottom of the shaft. Just as the poor fellows alighted, the first shot went off, and shot after shot followed until the whole five had gone off. The fourth man, named Martin Slatery, succeeded in maintaining his position in the kettle, and on being drawn to the surface was able to report what had happened. The manager, Mr. B. A. Meir, and a number of men at once descended to the bottom of the shaft, and they found that the three men had fallen right amongst the explosives. Graham and Wood were badly destroyed, and were quite dead, but Clark exhibited life. The poor fellow had only been raised from the stones on which he was lying when he immediately expired. The bodies were brought to the surface without delay.

**IMPERIAL INSTITUTE.**—The register of one year's visitors to the galleries and the Colonial and Indian Commercial Collections—exclusive of the use of the buildings made by Fellows and their friends—commencing from May 10th, 1893, the date of the inauguration by the Queen, has been completed, and showed a total attendance of 555,480 persons; of this number 295,757 were admitted free. The present summer and autumn season will be inaugurated by H.R.H. the Prince of Wales to-day (Saturday).



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LONDON: MAY 12, 1894.

### DOES HOME MINING PAY?

THIS question is often put to brokers by investors, and is,  
 we fear, too often answered wrongly in the negative. We  
 believe that it does pay, when properly handled—better,  
 in fact, as a rule, than foreign mining; and this we know to be  
 the opinion of some eminent authorities who have had oppor-  
 tunities of studying both sides of the subject. To the question,  
 "What is a profitable mine?" the mining engineer will answer,  
 "A mine which gives large returns in proportion to the money  
 legitimately spent upon it," and he will certainly have no hesi-  
 tation in so classing all mines which return their capital outlay  
 in 10 or 15 years, and then continue to give dividends of 5 per  
 cent. or upwards for a considerable period. This, too, would  
 have been the answer of the old-fashioned speculative investor  
 or "mine adventurer," now almost extinct. But the answer  
 of the modern speculator is usually quite different. What he  
 considers a profitable mine is one which enables him  
 "to get out quickly at a profit." It is obvious that these two  
 definitions do not usually apply to the same mines—in fact, the  
 mining engineer's successful mine may be, and often is, the

modern speculator's failure, and vice versa. To take an actual  
 case—which is the type of very many—it is common to see East  
 Pool Mine referred to as a "poor concern," its returns are  
 spoken of as "wretched," and so on. What are the facts?  
 East Pool in 60 years working—the re-working of an old and  
 profitable mine, be it remembered—has returned its original  
 capital in dividends hundreds of times over, while its  
 average yearly dividends since 1882 have alone been  
 equal to 700 per cent. on that capital. And at  
 the present, with some "ends" certainly poor—with its  
 "reserves" considerably diminished as compared with  
 the old times, and with an abnormally low price for tin—the good  
 old mine is able to keep its extensive machinery in working  
 order, to pay its way while opening up new ground, and even  
 to give dividends, which are large in relation to the capital actu-  
 ally called up, without trenching upon a reserve fund, which is  
 now something greater than the total amount of that capital.  
 True it is that speculators who have bought East Pool shares  
 at many times their par value have sometimes miscalculated the  
 variations in the mine and the tin market, and so have suffered  
 considerable losses, but these have been balanced by gains simi-  
 larly made by others, or at other times by themselves, and do  
 not in any way affect the mine itself, and its capabilities present  
 or future. We have not referred to East Pool because it is a  
 remarkable exception; rather because it is a type of very many  
 others in the West of England. Thus, in the following table  
 we give the leading particulars of the present workings of eight  
 dividend mines, all of which had been previously highly profit-  
 able:—

Name of Mine.	Period.	No. of shares.	Last Call.	Total calls per Share.	Total Divs. per Share.	Excess of Divs. over calls.
Carn Breh...	1832-94	6,000	25s., 1882	21 12 5	65 11 8	279,775
Devon Consols	1844-94	10,240	10s., 1887	2 0 0	118 7 6	1,211,904
Doleath	1799-94	4,700	p.c., 1850	9 12 6	133 17 10	582,800
East Pool	1834-94	6,400	—	0 9 9	66 1 6	419,760
Levant	1820-72	2,800	—	0 10 0	212 10 0	175,000
South Conderrow	1872-94	2,500	1881	11 9 6	13 9 6	66,328
Tincroft	—	6,123	2s. Aug. 1893	7 7 7	18 5 3	257,850
West Kitty	—	6,030	3s., 1881	0 12 0	18 3 0	105,300

It will be seen that the excess of profits over calls in these eight  
 mines during their present workings, mostly of 50 years or more,  
 amounts to over three millions sterling, or, if we add the present  
 share value of the mines, according to the latest quotations,  
 three and a-half millions. The profits from the previous workings  
 of these mines must have been at least as great, while of mines  
 no longer working there were certainly hundreds of an equal  
 average richness.

Let us now take eight old dividend mines, which are at  
 present making calls, as given in the following table, in which we  
 include two, and perhaps three, whose prospects for the moment  
 are certainly not brilliant.

Name of Mine.	No. of Shares.	Last Call.	Total Calls per Share.	Total Dividends per Share.	Excess or Surplus.
Botalack	2,220	7s., 1893	£18 4 6	£58 0 0	+£3,880
Killifreth	6,700	2s., 1890	5 11 8	2 7 6	-£9,200
Lovell	7,165	1/3, 1893	1 16 7	0 8 3	-£10,151
Phoenix United	10,165	2s., 1893	6 19 6	2 1 4	+£13,090
South Frances United	6,000	10s., 1891	34 9 4	59 1 8	+£8,320
Wheal Agar	6,000	8s., 1893	22 17 8	7 14 6	-£9,950
Wheal Grenville	6,000	50s., 1890	17 10 0	13 2 6	-£21,750
Wheal Kitty	8,590	2s., 1893	4 1 6	13 1 6	+£77,318

In this group we have an excess of dividends over calls amount-  
 ing to over 140,000, to which must be added the present value  
 of the plant, and the prospective value of the mines which, in  
 some cases at least, are of a highly promising character. In view  
 of such facts as those set forth above, it is surely very surprising  
 that capital is practically unobtainable at present for home  
 mining, although it is very freely subscribed for all sorts of  
 foreign mining proposals.

### MINING IN NEW ZEALAND.

THAT mining is now recovering—slowly, it is true, but none  
 the less surely—from the depression that has of late  
 afflicted it; that it is steadily regaining the ground it lost,  
 is the opinion of not a few who are closely watching the signs.  
 The kind of rest it has enjoyed—or, should we not say mis-  
 joyed?—has seemed to generate renewed energy, and from all  
 quarters of the globe we receive reports that are distinctly  
 hopeful and encouraging. There appears to be one general  
 determined, almost concentrated move forward; a desire to lift  
 the industry out of its forced lethargy; a determined effort to  
 make it regain the favour which abuse and dishonesty have for-  
 feited. The suspicion which was engendered by a prevalence of  
 these latter vices is happily being removed, and confidence is once  
 more quietly taking its place. The eyes of the public are not  
 directed, as many suppose, to one quarter of the globe. They  
 are not gazing upon Western Australia as the only land of prom-  
 ise; nor is their attention directed to South Africa as the  
 only other quarter upon which to base their future hopes.  
 Other regions are taking part in this march of progression,  
 not the least of which is New Zealand itself. This country  
 possesses, as is pretty generally known, unique and splendid  
 advantages, with the exception of an inadequate water supply in  
 the dry seasons. Undoubtedly, this is a great and serious diffi-  
 culty, but as it is the one great obstacle against which most  
 mineral-producing regions have to contend, we cannot isolate  
 New Zealand for this defect. Happily, this is a difficulty that  
 can be overcome. In this country it can more easily be com-  
 bated than in most others. The remedy that could be applied  
 in this particular case is to more carefully conserve the water.  
 As a matter of fact, there is no country in the world better  
 watered than this colony, and, in some seasons, there is plenty  
 to spare; so that if a system of conservation was effected, and  
 all available sites used for dams and reservoirs, there would  
 always be plenty of water to carry on mining operations. After  
 all, therefore, it is not Nature which has to be blamed, so much  
 as the companies working there, whose advantage it would be to



get rid of these obstacles, and so give themselves an opportunity of operating more successfully. At the present time the water from every stream in the vicinity where mining is carried on is utilised to a certain extent by the miners, and where the water can be brought to command ground at a moderate cost it has been done, but there are many instances in which water is allowed to run to waste, nearly the whole of which could be conserved. It is true, there is a difficulty in the way of persons holding inferior water-rights, constructing dams, or reservoirs in the beds of streams, notwithstanding there may be a splendid site where a large body of water could be stored at a small outlay. Those holding superior rights would not contribute to the cost, and those holding inferior rights would, in dry seasons, be compelled to allow a sufficient quantity of water to flow out of their reservoir to supply those holding prior rights, even were that quantity not coming into the reservoir from the stream from which these rights were granted. It is, however, possible to regulate this difficulty, so that a person holding the first rights from any stream could only claim his quantity if it was flowing into any dam or reservoir, and accordingly give more encouragement to parties to conserve the water.

There are numerous rivers and streams flowing at high velocities which, if properly utilised, are capable of giving a cheap motive power to work the whole of the mining and other machinery in the colony, and as there are generally only short distances between those rivers and streams, they can easily be used as a force to generate electricity as a motive power for transmission to the different places where machinery requires to be erected, where direct water-power is not available, and thereby save the cost of fuel where steam machinery has to be employed. By this means a lower grade of ore could be reduced and treated at a profit than at present. Speaking of low grade ore, unfortunately it is only too abundant in New Zealand. Free milling quartz is very rarely met with. The ore generally is refractory, and what is wanted in the colony now to give mining there a greater spurt, and to set it firmly on its legs, is the chlorination process. Although labour is practically dear, it is very skilful, and, with other advantages, does not make the cost of mining heavy. We do not contend, however, that the colonists have not displayed energy in tackling these difficulties, or that their efforts have not been fruitless. What we say is that they have not been energetic enough; they have not kept pace with the times, and have been too conservative in introducing modern inventions. By improvements in gold-saving appliances, both auriferous drifts and lodes can now be worked at a profit, which a few years ago were considered almost valueless. There is, however, much to be done, and no doubt the New Zealanders will early see it is time to set about doing it. To the mining industry—especially that of gold—the colony owes more than can easily be computed. In the words of the Minister of Mines:—"I would call the attention of honourable members to its [gold mining] importance, and the advantages the colony has derived from the discovery of gold. This has been the means of bringing many thousands—I may, in fact, say hundreds of thousands—of persons to our shores who never would otherwise have come. There is a charm about gold mining that no other class of mining possesses; the reason being that in the early days of the gold fields, both in this and other countries where gold has been discovered, it was usually easily got. The ground in general was of a shallow depth, and in many instances rich patches were found requiring but little labour to get it. . . . The advantages the colony has already obtained through the influx of a large mining population, and the prospect of further valuable discoveries being made in lands still belonging to the Crown, or which possibly might be acquired from the native owners—lands which in most instances are valuable neither for agriculture nor pastoral purposes, but which would nevertheless prove of far greater value if gold were discovered—are well known; and efforts to extend the present workings to a greater depth deserve encouragement, as by such extensions the gold fields are made capable of supporting a larger population, and of giving profitable employment to the labouring classes. A good gold field rush would do more than anything else to satisfactorily solve the unemployed question." Here, then, is every encouragement to prosecute the gold mining industry with renewed zest; to tackle the obstacles which idleness and want of enterprise have created; and to build up in a promising colony an industry from which it may derive incalculable benefit.

### A TRANSVAAL TROUBLE (?)

THE inevitable accompaniment of any new discovery of gold is an exodus from every conceivable quarter of all sorts and conditions of human beings, who journey, notwithstanding the privations they have to undergo, to this new field in the hope of making their fortunes. They very frequently, however, drop the bone for the less substantial shadow. When rumour announced the discovery in Western Australia of extraordinary rich claims there was an immediate rush from nearly every district of the continent, with the natural result that hundreds find nothing to do; little to pick up; and a lamentable scarcity of nourishment. A similar experience is now taking place in South Africa. The discoveries of the precious metal in the lately-conquered country of Matabeleland are attracting thousands from the Transvaal, a fact which is greatly lamented by one of our South African contemporaries. It would matter little if these emigrants were composed solely of the riff-raff of the community, for any mining or other district would benefit from a wholesale clearance of such, but as among them are many capable men who will be greatly missed, this emigration is not regarded with complacency by the publication in question. No doubt, to the Transvaal inhabitant this is a very sad thing, but we have always found that for every good man we lose there are a dozen others to take his place. Mining, we know, is a profession that presents in

great measure an exception to this rule. To tackle a mine and work it successfully, requires an intimate acquaintance with the local conditions; with the geological structure of the district; with the class of labour employed; with the language and climate of the country, and many other circumstances. Such knowledge cannot be picked up in a day, and a man who possesses it is invaluable, and may command a considerable salary. We can scarcely bring ourselves to believe, therefore, that the Transvaal is losing such a class of men, but only those whose departure will be little felt, and whose place will be easily filled. Considering the progress this country is making; the boundless wealth of her gold fields; the opportunities that are daily offering themselves to skilful men; the avenues to success and prosperity the future is opening out, we can scarcely credit, with all due respect to our contemporary, that those who are doing well would suddenly and unwisely leave a land of promise for an uncertain and precarious existence in another district. In the article in which it draws attention to this trouble (?) some facts are presented more acceptable and conceivable, and which we feel more inclined to reproduce and endorse. "It must not for a moment be supposed that the Transvaal is thoroughly exploited, nor that we have discovered, let alone developed, a tithe of the mineral resources within the boundary of the State. So far, indeed, there are wide areas on the map between the various districts where mining is going on, in which even Witwatersrand itself, with its extended series of blankets, is but a small yellow blot upon the chart of the Republic. Then there is a similar blot at Klerksdorp, another at De Kaap, another at Lydenburg, still another at Zoutpansberg, with two very small ones at Nylstroom and Malmansi. Add them altogether, throw in the coal areas of Middelburg, Boksburg, Wilge River, and the Springs, plus the two small areas at the Albert and Transvaal Silver Mines, and then the total is but an infinitesimal portion of the whole area of the country." It likewise enumerates the other mineral resources of the Transvaal, and cynically questions whether, now gold mining is the fashion, it is too much to hope that serious attention will be paid to them by the State. In fact, it draws attention, in Olla Podrida fashion, to all the mineral resources of the country, and in an able leading article, the *Financial Record* has, undoubtedly, done a good turn for the Transvaal mining industry.

### NOTES AND COMMENTS.

THE flat tone which has of late characterised the Kaffir market is very likely now to give way to renewed activity on the news received this week of another "record" Randt output. It is difficult to understand for what reason this depression has taken place, except it be the action of an inconsistent Press to depreciate the increasing results from individual mines. No doubt, such an action has had an appreciable effect upon the confidence which the public were reposing in South African mines, and led them almost to distrust the reports that were received from the other side. This further increased output should, however, tend to re-assure the would-be supporters of Kaffir securities. Indeed, the effect has already been felt, for on the news being made known on Thursday the tone of the South African market improved. The total yield for April amounts to 168,745 ounces, which is an increase of 3373 ounces over the output for March, and of 56,602 ounces as compared with the corresponding month of last year. It is needless, of course, to reiterate the significance of this. Sensible persons need not be reminded of the wealth of the Witwatersrandt, or that there is no occasion to eye these "records" with mistrust.

As we predicted last week, the proceedings at the ordinary general meeting of the White Lead Company were of a vastly different character from those to which we have of late been accustomed. There was complete harmony, and a general feeling that difficulties have been surmounted and that the future looks hopefully. Indeed, the thankfulness of the shareholders at this brighter aspect of affairs almost expressed itself in a hand-shaking of those gentlemen with whom they not very long ago severely found fault. They have, however, always admitted that to Sir Henry Tyler they owe a great deal. Had it not been for the pecuniary assistance that gentleman has from time to time afforded, it is questionable whether the present company would ever have had the opportunity, as it has now, of looking to the future with encouragement. The speech of the Chairman was full of hope. It was just such a report of which the shareholders were sadly in need to revive their drooping confidence. The manager came in for not a little praise. No doubt it has been thoroughly earned. At any rate, the tribute paid to him will do no harm. It will inspire him with greater confidence, and, with the knowledge that his efforts will be appreciated, will induce him to strive in the future with increased perseverance.

We learn by this week's mail that some important experiments upon concentration were about to be made at the beginning of last month at the New Primrose property, with a view to determining whether, by proper sizing of the pulp, it may not be possible to obtain far better results from Frue vanners than has hitherto been found practicable. With this object, the stream from 10 stamps will be led into hydraulic separators, worked on the Spitzkasten principle; but so constructed that the pulp will be divided into four distinct classes, for each of which a separate discharge orifice is provided, whilst the slimes running away may be regarded as constituting a fifth class of material. The first two classes, which will be composed of the heavier sands, will each be led on to two vanners, and the two classes of "middlings" each on to one. A total of six vanners will thus be employed, as usual, to deal with the discharge from 10 stamps, the difference lying in the manner in which the material will be supplied. "Careful samples will, of course," the *South African Mining Journal* states, "be continuously taken of the pulp pass-

ing on to each vanner, as also of the concentrates and residua. The slimes passing away will be concentrated upon canvas strakes, by which means it is hoped that a certain proportion of the fine sulphurets and gold will be caught, and that by this method it will be found possible to considerably reduce the assay value of the slimes."

THE same journal also gives some interesting information respecting operations at the Crown Reef property. It is intended in future to systematically test the main reef at the lower levels with a view of sending portions, if not the whole, to the mill. Results at the fourth level have so far proved highly satisfactory, and it is believed that if the whole body of ore at this point were crushed an average grade of 5½ dwts. could be maintained. Should this prove to be the case, our contemporary observes, it is clear that within a very short time an increased number of stamps could be kept at work on payable rock, although, for the moment, it will probably tax all the resources of the management to keep the new 120 stamp mill supplied. The latter has been running, we are told, most satisfactorily, and as regards costs, it is believed that for the present all expenses of milling, tramming, and treatment by cyanide are recovered by some 6s. per ton, but it must, at the same time, be borne in mind that only about 65 per cent. of the total pulp is treated, a fact which necessarily materially reduces the cost when this is calculated upon the total tonnage milled. "Since the cyanide works started everything has been running very smoothly, and it must at once be conceded that, if the principle of direct treatment be admitted as correct, the arrangements adopted for its practical working reflect great credit upon those responsible for their design."

TIN does not stand alone in the metal market in its low values. Copper, also, has fallen within recent years, until a whilom prosperous concern for the production of that commodity—Mason and Barry (Limited)—has had to confess, through its Chairman, that with copper under £40 a ton, there is no margin for profit-making. With this in view, Mr. Barry's speech of Monday last was the best that could have been made. There were no illusory promises of vast improvements in the future. The plain state of the case, unobscured by any artifice of rhetoric was put before the shareholders, and they were given an opportunity of realising how, under circumstances of peculiar difficulty, with all the responsibility of a heavy and prolonged litigation, with copper prices below zero, the directors had skilfully guided the concern through rocks and over shoals. Candidly, it may be said that the task the directors have had before them is to make the best of a bad job, which they have set themselves to do with patience, resolution, and ability. It would be curious to know upon what principle of financial policy the critical shareholder at Monday's meeting proceeded in his objection to the well-reasoned policy of the board, which makes the interests of the present subserve the safety of the future, should have found the most cordial assent upon all hands, and, no doubt did command the approval of the shareholders in the greatest number. What the value of many of the company's possessions will be when the mine has exhausted itself is, perhaps, problematical, but it is safe to assert that it will not bear any appreciable proportion to the original outlay. Such is the greatest possible justification of the directorial policy reflected in Mr. Barry's speech.

ANOTHER instance of the occasional fact of reconstruction marking the success rather than the failure of an enterprise, is exhibited by the resolve of the South African Gold Trust and Agency Company shareholders to re-cast their concern. In this case the changes will not be sweeping ones; in fact the course has simply been taken because it is the easiest and least costly method of effecting a re-distribution of the shares. Under these conditions, the assent given by the shareholders to the scheme proposed to them, carrying with it, as it does, the benefit of extinguishing the remaining liability upon the ordinary shares, could hardly have been less heartily or unanimously given. The concern is evidently in a good way. A glance at the balance-sheet and the report is sufficient to attest its stability. There are large dividends for the present, and larger dividends in prospect for the future. The principle upon which the company is constructed is evidently a sound one. Mining is a speculation, and it is safer to play a watching and waiting game—to make a well-judged investment here, and a judicious subscription there—than to accept all the initial risk and hazard of company formation. Here lies the safety of the company and its strength in times when other concerns are exhibiting signs of weakness. The past record of the Trust and Agency is so satisfactory as to spread confidence among all those interested therein, both in regard to the management and the probabilities for the future.

THE Board of Trade Returns for April are encouraging showing, as they do, a decided improvement upon those for the corresponding period of last year. This is evidence that the trade of the country, as many suppose, is improving, though, it must be admitted, not to any great extent. It is quite enough to know, however, that it is moving in the right direction. The imports are valued at £35,008,029, an increase of £2,887,869, equal to 8.9 per cent., and the exports of British and Irish produce at £17,559,876, an increase of £941,899, or 5.6 per cent. Exports of foreign and colonial merchandise are valued at £4,810,362, compared with £4,856,184. As regards the imports, each class of goods, except tobacco, shows higher value; but, as in previous months, raw materials account for much of the increased value, the increase on these articles alone being £1,154,000. As to British and Irish exports, the classes of goods of which more was shipped are articles of food and drink, raw materials, yarns and textile fabrics, and machinery; but less of metals, apparel, and chemicals was sent away. The demand for coal was 621,602 tons in excess of April, 1893, and the coal



shipped for the use of steamers in the foreign trade rose from 611,792 tons to 788,884 tons. The decrease on the total shipments of iron are due to the smaller demand for tin-plates and sheets, the quantity being 24,594 tons, compared with 39,298 tons, while the quantity sent to the United States was only 13,210 tons, against 31,651 tons.

The metallurgical and mineral trades of the Kingdom are accustomed to look for information of value to the gatherings of the Iron and Steel Institute. Nor are they generally disappointed. In this respect last week's meeting was no exception to the rule. A greater use of soft coke and coal would result were the trade to generally adopt the new form of blast furnace proposed by Mr. William Hawdon, of the Newport Ironworks. He is strongly of opinion that in the Cleveland district there has been too great a tendency to build furnaces too large, especially as regards diameter. The furnace, which his experiments have proved to be most effective, is of comparatively narrow dimensions, with the upper part enlarged. There can be little doubt that the higher bosh recommended would greatly relieve crusting in the furnace, and to that extent would be a great benefit. In one case, where a hole was drilled from the outside of the furnace to the top of the bosh and part of the charge abstracted, this was found to be so cold as to be easily handled, although the furnace was at work. No stronger proof can be obtained of the fact that in a wide furnace with a high bosh a great part of the ore lying around the sides is never submitted to the heating and reducing action of the ascending gases. These evils are remedied by the new form which Mr. Hawdon has tried.

In connection with the general subject of the shape of furnaces, we may remind our readers that a special committee is in existence, appointed by the South Staffordshire Institute of Iron and Steel Works' Managers, for obtaining the best shapes, not of black furnaces, but of puddling furnaces. We understand that some headway has already been made in this matter, and that the committee are in possession of information which would be useful to furnace builders and furnace owners alike. Considerable difficulty has, however, been encountered in obtaining the results of experience as to economy in fuel use, the majority of the 60 leading firms applied to on this point fearing to give the information, because it might possibly prejudice their position in regard to competition. It is difficult, however, to understand how this can be the case, seeing that the committee, if they publish anything of the matter, would only do so under letters and numbers, and in a manner calculated not to injure individual interests, but to benefit the whole trade by the deduction of general principles. Another objection by puddling furnace owners has been that such information would get abroad, and would be utilised by our American competitors. It is rather late, however, to raise such objections in these days of commercial and industrial publicity, and we trust the committee's further enquiries now proceeding will meet with a more general response in the interests of the British iron trade.

A rather heated discussion has recently been proceeding in the columns of the South African papers upon some questions relating to the financial administration of mining companies. Whether or not the capital account of a mine should be kept in strict conformity with the actual value of the property is a point upon which there has been many confident expressions of opinion. Upon one side it is persistently urged that the claimant should decrease with every balance-sheet in accordance with the value of the quantity of ore extracted during the period covered by the statement, which naturally decreases by so much the term of the mine's existence. Those in opposition to this view expatiate with much force and emphasis upon the difficulties inherent in the endeavour to keep the capital account in actual correspondence with the estimated life of the mine. Quantity and quality have both to be taken into account in the endeavour to get at the value of the ores remaining in the mine, and here obviously is a calculation exceeding the wit of man. As generally in a discussion of this sort, truth lies probably between the two extremes. A fixed and invariable estimate of a mine's value is open to almost as great an objection as one that fluctuates with all the sensitiveness of a barometer.

The shareholders in the United Langlaagte Gold Mining Company appear, by the published report of their last half yearly meeting, to have accepted in the right spirit the comparatively unfavourable results of the more recent workings. Evidently they have properly appreciated the fact that the improvements lately made in the plant had not got into thorough-going order, and to that extent the management of the mine had been hampered. Now that the new compressor plant has been working hard for some months, the next report for the shareholders should be a much more hopeful affair. Cyanide plant will immediately be erected, and when the works of development, now going on apace, have been carried to the lower levels, the finances of the mine should exhibit considerable improvement. Even under the present difficulties, the result of the working cannot be really described as a loss, although operations have only been proceeding at half time, for the money in hand has been spent upon development, and for working off the depreciation upon machinery and other of the company's possessions. There are plain indications that the next level reached will be more regular and richer, which is another ground for hope.

THE INSTITUTION OF MINING AND METALLURGY.—The sixth ordinary meeting of the third session will be held next Wednesday, in the Lecture Theatre of the Geological Museum, Jernyn-street, S.W., at 8 p.m., when Mr. Joseph Garland will reply to the discussion on his paper on "Nickel Mining in New Caledonia," read on February 21, 1894, to be followed by the reading of a paper on "The Sampling of Ores and Tailings," by Mr. Thomas Clarkson (member) with a practical demonstration.

## OUR CITY ARTICLE.

FRIDAY EVENING.

### THE MINING MARKET.

An uncertain week.—An easy carry over—Kaffirs depressed.—Miscellaneous fairly steady.

THIS has been an uneasy week for the Mining Market, which has gone through a surprising succession of changes such as it seems hopeless to assign to any controlling causes less uncertain than the caprice of the dealer or the speculator. Chartered have been especially dubious, and the almost continuous downward movement which has been theirs during the week is evidently due to the weakness of the "bull" element, shaken out at the settlement. The anticipation of Wednesday's carry-over occasioned considerable dulness in both markets on Monday and Tuesday, South Africans being, perhaps, the most lively. Most of the more speculative stocks commenced falling on Monday. Chartered, Bechs., and Oceana went down, carrying with them a number of smaller-priced land shares. Firmness, on the other hand, characterised African Consolidated and Central Africans, while diamond shares hardened well. Rand gold shares were fairly active. Improvements took place in Simmers, Langlaagte, Primrose, Glencairn, Geldenhuys Deep, Paarl Central, Van Ryn, United, Roodepoort, and Princess. The disposition to dulness deepened into a pronounced gloom on Tuesday. Operations were very restricted all along the line, and the advances noted on the previous day were in most cases—so far as the Rand shares were concerned, at least—covered by a corresponding movement backward. These falls were due to no change in the prospects at the mines, but simply to the prevailing depression. Among the falling shares were Simmers, Rietfontein, Primroses, Crowns, and Villages. De Beers remained firm, but Jagersfontein went back. Miscellaneous shares remained generally firm during the days preceding the settlement. Declines were, however, registered in some unimportant directions, where the bettering tendency all round was not strong enough to combat particular circumstances of an unfavourable nature. When the carry-over came, it was easily and quickly effected, the account being a light one. De Beers were done at 1s., Jagersfontein at 1s. 3d.; while on Rand shares the contango averaged 7½ per cent. per annum. The decline in the making up prices in South African shares was not so strongly marked as the recent protracted dulness in the market might have led one to expect. There was little disposition manifested to transact business for the new account. Relapses occurred among the heavier priced land shares. De Beers, on the other hand, hardened to 16½. Rand shares were generally flat, falls occurring all over the department. Miscellaneous shares were, however, somewhat firmer. Thursday morning opened badly for the South African market. The gloom of the previous days seemed to have settled permanently. Later in the day, a more hopeful tone set in, and the merciless immolation of weak "bulls" led to a more confident feeling. Extensive dealings took place and movements were generally in favourable directions. Chartered were especially illustrative of the healthier condition prevailing, a rise carrying them 9d. higher upon the day. Kaffirs continued to improve throughout the day, and at the close a decidedly better tone characterised both markets.

#### British Mines.

There has not been much life in the Cornish market this week, and business on the whole has been very much restricted. Dolcoath have fallen to £71. It is very disappointing to find that the in the shaft has not yet been cleared, and no reliable information appears to be obtainable as to the probable date of the engine starting to work again. It is certainly a much more serious matter than was first considered, and now most of the very rich ground in the bottom of the mine is under water. Carn Brea are quiet at £11. A fair business has been done in Killfretth. Tincofts are steady at 13. West Kitty have been in request at 6½. Wheal Grenville shares are tightly held, and run it is very difficult to say at what price they could be bought or sold. Fortescue's shaft is still worth £100 per fathom, and the outlook is most encouraging.—Risen: Tincoft, 5s.; West Kitty, 2s. 6d.; and Wheal Grenville, 20s.—Fallen: Carn Brea, 5s.; Cook's Kitchen, 5s.; Dolcoath, 140s.; East Pool, 5s.; Killfretth, 2s. 6d.; Polberro, 2s. 6d.; and South Crofty, 5s.

#### South African Shares.

Some of the higher-priced land shares aside, there was no tendency to weakness in the market on Monday last. In view of the impending fortnightly settlement there was little disposition to transact business, but the movements were generally favourable. New Rietfontein were especially conspicuous, bidding being resumed by some of the supporters of the shares. An improvement is generally supposed to have taken place in the mine. New Primrose and Glencairn hardened, the former being 1-32 higher at 4 13-32, and the latter ½ at 33s. 6d. Simmer and Jack continued to improve, and left off ½ better at 7½. United Roodepoort hardened ¼, to 2½, and Langlaagte were somewhat firmer at 4 7-32. Crown Reef were also in demand, the recent dividend bringing in buyers at 9½, or ¼ higher, but Stanhope eased off 1-32, to 1½. Among deep level shares, Geldenhuys Deep and Consolidated Deep Level advanced to 3 9-32 and 1 31-32, while Rand Mines dropped ¼, to 8½. Declines were registered among the lower priced shares. Bantjes fell 1s. to 14s. 6d., Luipaard's Vlei were 1-32 lower at 10s., and Modderfontein and Randfontein relapsed a trifle, to 7s. and 14s. 9d., but Paarl Central improved 6d. to 18s., and Van Ryn rose to a similar extent to 16s. 3d. Diamond shares were stronger. Rises to the extent of ½ took place in Jagersfontein and De Beers. Bechuanaland Exploration, Chartered, and Consolidated Gold Fields were a trifle weaker. A contrary movement took place in Oceana Development, which left off at ½ premium. The approach of the carry-over tended to make the South African market very flat on Tuesday. The business transacted was very restricted, and in many cases shares were freely offered below the prices of the preceding day. Chartered relapsed to 32s. 6d., the lowest quotation registered for some time. Bechs. receded to 28s., Consolidated Gold Fields to 2½ sellers, Oceana to 2½, Zambesia to 2½, Central Africans to 4s. 3d., Gold Trusts to 18s. 6d., Johannesburg Waterworks to 22s. Rand shares were lower, notwithstanding that the prospects at the mines remained unaltered. In gold shares Sheba Lode Extension fell ½ to 10s., and Transvaal Gold went down ¼ to 1½, while declines of ½ took place in Crown Reef, New Rietfontein, New Primrose, and Village Main Reef. A decline of 3-32 was recorded in Gold Fields of Mashonaland at 16s. 3d., and one of a like amount in Nigel at 2½, relapses not exceeding ¼ taking place in Crosses, Jumpers, Langlaagte, New Chimes, Salisbury, Princess, Simmer and Jack, United Roodepoort, Wemmer, and Wolhuter. Worcester were asked for and rose ¼ to 2½, and Goldenhuis bettered to 14½. Cheaper shares were equally dull, May Deep Level dropping 1s. to 7s., and Spes Bona 1s. to 12s. 6d. Smaller falls were also registered in various other shares. Land shares were also depressed, Oceana declining ½ to 2½, and Zambesia

going down to 3. Chartered lost 1s. 3d. at 32s. 3d., after having been 32s., sellers, Bechuanaland, after touching 28s., left off at 28s. 6d., and Consolidated Gold Fields fell ¼ to 2 13-32. Declines to an unimportant degree occurred in Balkia Land, Johannesburg Trams, South African Gold Trust, and South African Trust and Finance; but African Consolidated were asked for and advanced to 1s. 10½d. Wednesday's carry-over was effected very easily, the account being a light one. This, however, did not influence the rates to any appreciable extent, those upon South African gold shares ruling harder than usual, the average contango being about 7½ per cent. De Beers were done at 1s., and Jagersfontein at 1s. 3d., while on Gold Fields about 2d. was paid, and on Chartered 1d. to 1½d. But little business was transacted upon the new account, and a flat tone prevailed, culminating about noon, and giving place to a small recovery towards the close. Chartered exhibited a marked weakness, and at one time were offered at 31s. A depression spread also among the other heavier priced shares, Explorings finishing at 4½, Bechs at 27s. 6d., Oceana at 2½, Zambesia at 2½. The news of a large sale of diamonds, now confirmed, sent De Beers up ¼ to 16½. On the other hand, a fall of ½ took place in Jagersfontein, which were weak at 16½. The generally depressed tone of the market had its effect upon Rand shares. Rand Mines were down ½ to 8½, and Wolhuter ½ to 2½. In other shares the declines were small, and did not reach more than 3-22 or ¼, this being the extent of the fall in Goldenhuis Deep, Jumpers, and New Rietfontein. Among the lower-priced shares, East Rand were offered at 13s. 3d., George and May relapsed 1s. to 22s., and Spes Bona dropped to 12s., but Paarl Central were a shade harder at 18s. 6d. During the greater part of Friday the South African market remained flat, but towards the close there was a distinctly improved tone, owing mainly to the satisfactory conclusion of the settlement. Chartered especially marked the alteration for the better which had taken place. Considerable operations in the shares were made, and in the result they closed 1s. better on the day, after having gone as low as 31s. 9d. Consolidated Gold Fields were bought at 2½. Following upon the announcement of a yield of 168,745 ounces for April, an improvement took place in Kaffirs. This record is an increase of 3375 ounces over the March returns. Crowns and Villages exhibited improvement. Langlaagte, after being £4 sellers, became 4½ buyers. Primroses, which had relapsed to 4½ sellers, after opening at 4½, finished buyers. Cities, Jumpers, Wemmers, Henry Nourse, and others finally showed declines, but closed above the worst. Champ d'Or and Kleinfontein slightly receded, and May Deep were weak, the return exhibiting a decrease. Among diamond shares there was a marked improvement. De Beers rose to 17½, and Jagers to 16½. There was also a generally better tone among land shares, which rallied in sympathy with Chartered. Zambesia rose ½ to 2½, while Exploration gained ¼, to 1½ prem., and Consolidated Gold Fields were finally 2½ bid after being offered; but Mozambique and South African Gold Trust declined to an inconsiderable extent. To-day's dealings in the South African market did not bear out the anticipations of improvement which were formed yesterday. Evidently there will be no alteration for the better until after the holidays. Diamond shares remained firm, De Beers continuing to improve.—Risen: Bultfontein Consolidated, 6d.; Central African Zouta, 6d.; Champs d'Or, 1s. 3d.; City and Suburban, 2s. 6d.; De Beers, 10s.; Kleinfontein, 1s. 3d.; Klerksdorp, New, 6d.; Modderfontein, 1s.; New Virginia (Transvaal), 6d.; Stanhope 1s. 3d.; Van Ryn, 1s. 3d.; Fallon: African Gold Recovery, 1s. 3d.; Bechuanaland, 1s. 6d.; Buffelsdoorn, 1s.; Chartered, 6d.; Consolidated Gold Fields, 1s. 3d.; Crown Reef, 2s. 6d.; East Rand, 2s.; Edwin Bray, 6d.; Exploration (New), 2s. 6d.; Exploring, 7s. 6d.; Ferreira, 2s. 6d.; Frank Johnson, 1s. 3d.; Goldenhuis Estate, 2s. 6d.; Goldenhuis Main Reef, 1s. 6d.; Gold Fields of Mashonaland, 3s. 9d.; Gordon Diamond, 6d.; George and May, 1s. 3d.; Grahamstown, 6d.; Henry Nourse, 2s. 6d.; Heriot, 2s. 6d.; Johannesburg Trams, 6d.; Jumpers, 5s.; Langlaagte, 2s. 6d.; Main Reef, 1s. 3d.; May Consolidated, 6d.; May Deep, 2s.; Metropolitan, 2s. 6d.; Meyer and Charlton, 2s. 6d.; Mozambique, 1s. 3d.; New Chimes, 2s. 6d.; New Crosses, 1s. 3d.; New Primrose, 6s.; Nigel, 5s.; Nyassa, 2s. 6d.; Oceana, 2s. 6d.; Princess, 1s.; Randfontein, 1s.; Rand Mining, 5s.; Salisbury, 2s. 6d.; Spes Bona, 2s. 6d.; Transvaal Exploration, 1s.; New Iry, 1s. 3d.; Wemmer, 5s.; Wolhuter, 2s. 6d.; Worcester, 2s. 6d.; Zambesia, 2s. 6d.

#### Indian and Miscellaneous Shares.

The Indian and Miscellaneous market opened firm on Monday. Lisbons fluctuated, commencing 3s. 6d. buyers, easing off to the same figure sellers, and finally closing buyers. An easier tone prevailed among Indian mines, Champions and Mysore Reefs being the exceptions at small improvements. There were also gains of 6d. or 9d. in Day Dawn Block at 6s. 6d., Elkhorn at 12s. 6d., Gravel Gold at 6s. 6d., Montana at 5s. 6d., and De Lamar at 19s.; while, on the other hand, Broken Hill reacted ½, and Don Pedro, Colombian Hydraulic, and Day Dawn P.C. were all offered at small declines. Rio Tinto recovered 3-32 to 14½. There was more business done on Tuesday in the Indian and miscellaneous section than in the other department, though the general tone was exceedingly irregular. Broken Hill Props., De Lamars, Mount Morgan, Brilliant Block, and Poorman all improved. A favourable yield produced a demand for Montanas. Indians were generally quieter, the rumours of a possible mutiny somewhat affecting them. Lisbons opened well, but declined later on in the day, and falls were also registered in Barrett, Spitzkop, and Balkis Eersteling. Idahos and Don Pedros remained dull. Upon the conclusion of the Wednesday's carry-over there was a slightly better tone in the Indian and miscellaneous department. There were small recoveries in Champion Reef, Mysore Gold, and Mount Morgan, and also somewhat harder tone for Gravel Gold, Broken Hill, and Poorman. On the other hand, there were falls in Mysore Reefs, East Kootenay and Wentworth ordinary, while Aladdin left off at 1½, ½ down. An improvement of ¼ took place in Rio Tinto. There was a steady tone on Thursday among the lower-priced Miscellaneous shares, and whatever alterations the small amount of business tended to produce, were in the main in an upward direction. Waihi continued in request, it being rumoured that good news had been received. West Argentines and Idahos improved, and there was a better tone in Caratals. Among Charta Towers mines there were small advances in Day Dawn Block and Moorman, but Victory were flat, notwithstanding a favourable cable from the other side. A firm tone spread among Indians. Ooregums, and Champions improved, while there was a good under-current, which showed itself for Colombian Mines, Gravel advancing to 7s. Throughout to-day the Indian and Miscellaneous market remained very quiet. The principal feature was the rally of Aladdin's Lamp, which had fallen suddenly on the previous day. In the Indian market the feature was a small demand for Mysore.—Risen: Australian Broken Hill, 1s.; Bayley's Reward, 1s. 3d.; Brilliant Block, 2s. 6d.; British Broken Hill, 6d.; Broken Hill Proprietary, 1s. 3d.; Champion Reef, 2s. 6d.; Colombian Hydraulic, 6d.; Day Dawn, 6d.; De Lamar, 1s.; Frontino, 1s.; Golden Feather, 6d.; Gravel Gold, 6d.; Harquahalla, 1s. 6d. (allowing for div.); Jay Hawk, 6d.; Montana, 9d.; Mount Morgan, 5s. 6d. (allowing for div.); Mysore, 1s. 3d.; Pinos Altos,



1s.; Rio Tinto, 1s. 3d.; Richmond, 1s.; Waihi Gold, 3s. 9d.;  
Wentworth Priority, 1s. 3d.; do. Ordinary, 6d.—Fallen: Aladdin,  
5s. (allowing for div.); Baker's Creek, 2s. 6d.; Balaghat, 6d.;  
Don Pedro, 6d.; Gold Fields of Mysore, 6d.; Mosman, 6d.;  
Nundydroog, 2s. 6d.; Ooregum Ordinary, 1s. 3d.; do. Preference,  
2s. 6d.; Tolima A, 10s.; do. B, 10s.; Tharsis, 2s. 6d.; West  
Argentine, 9d.; West Australian, 2s. 6d.; do. 4s. paid, 1s.

## SETTLING DAYS.

(Ticket Days.) MAY. (Account Days.)  
Tuesday, May 29. | Wednesday, May 30.

## CONSOLS SETTLING DAY.

Friday, June 1.

## THE RUBIES OF BURMAH.

FURTHER LECTURE by PROFESSOR JUDD, F.R.S.

ON Tuesday afternoon Professor Judd gave a further lecture on the subject of Rubies at the Royal Institution, and remarked that one of the chief mysteries about the ruby is the source from which it derives its intense fiery-red colour. It is well known, of course, that various metallic salts constitute the colouring matter in a great many minerals, and that the salts of the metal chromium, in particular, are capable of imparting a wide range of colours. Thus every variety of tint can be given to artificial or "paste" gems, so as to produce the rich glow of the ruby, the fine blue of the sapphire, the green of the emerald, and the peculiar tints of the chrysolite and aqua-marina. Is the glow of the ruby due to some salt of chromium tinging the naturally colourless crystal of oxide of aluminium, which, as Professor Judd pointed out last week, constitutes the gem mineral—corundum? Until lately the chromium theory seemed the most natural one in the world, for the chemist in his laboratory could produce crystals of aluminium in abundance, and tint them with chrome salts to a nicety. Later investigations have tended to show that this easy and natural explanation is quite wide of the mark, and that the colour of the ruby is a mystery yet to be solved. In the first place, the most careful chemical tests have failed to show a trace of chromium in the ruby corundum, a fact still more conclusively shown by the delicate method of spectrum analysis. And next comes Professor Crookes with his marvellous vacuum glow experiments, and suggests all manner of strange properties in this simple oxide of aluminium.

It was shown in last week's lecture that when oxide of aluminium is placed in a partially exhausted glass bulb, and exposed to the action of a high-tension electrical current, it glows with a lovely crimson flush, and that exactly the same sort of glow is given under these conditions by ruby corundum itself. Professor Crookes finds, however, that he can prevent the glow by mixing oxide of chromium with the oxide of aluminium. Again, if the crimson light transmitted naturally by the ruby (through absorption) is examined by the spectroscopic, it gives just the same crimson bands that characterise the spectrum of the phosphorescent glow which comes from the oxide of aluminium in the vacuum tube. Finally, as an ultimate hint, we have Professor Crookes' curious discovery that white oxide of aluminium thus exposed to electrical bombardment for a prolonged period gradually changes to a pinkish hue. All these facts are most suggestive, and point to some mysterious property in the oxide of aluminium as to which at present we are in the dark. In speaking of the chemical composition of the ruby, the lecturer pointed out that this intensely hard gem is almost as simple in its constitution as the diamond. In the latter we have a single element—carbon, in its purest form.

In corundum we have the beautiful silvery metal aluminium, the lightest of all the metals, in chemical union with another element, oxygen, which, as everybody knows, is the active constituent of the air we breathe. In the purer corundums there are but slight traces of lime, oxide of iron, and magnesia, but in "april," which is the crystal which imitates ruby most closely, and is frequently mistaken for it, there is a large quantity of magnesia. Professor Judd's description of the ruby mines in Burma was very interesting, suggesting very plainly the manner in which the gems have found their way into the ruby gravel beds for which that country has long been famous.

No really fine rubies have ever been obtained except from Burma. The rulers of that country long kept the nature of the ruby mining operations a profound secret, and little information was forthcoming as to the circumstances under which the gems were unearthed until the British Government took over Burma in 1886. Then Lord Cross (Indian Secretary) sent out Mr. Barrington Browne, an eminent mining engineer, and his researches into the geological and mineralogical aspect of the question have pretty well cleared matters up. If Mr. Streeter's company afterwards formed to work the mines have found fewer rubies than was anticipated, it is not because the rubies are non-existent, but on account of the impossibility of preventing the theft and smuggling of objects so minute, and yet of such enormous value. There is, of course, the greatest temptation to pilfering, for the finest Burmese rubies are 10 times as valuable as diamonds of equal size. It is believed that the very finest stones are broken up in order that they may be the more readily concealed.

The mining district is about 100 miles north of Mandalay, where certain valley basins are flanked by peculiar mountains of igneous origin, granite, gneiss, and schist being the main constituents of the rocks. But closely associated with these rocks are layers of crystalline limestone, which stand out in sharp jagged ridges in every direction. This limestone, which is everywhere intimately associated with the gneiss, is a sort of matrix for a number of interesting minerals, including corundum, garnet, graphite, and spinel. The lecturer showed a large limestone crystal, in which was embedded a ruby of fine "pigeon's blood" colour, in proof of the important conclusion arrived at by Mr. Barrington Browne, that this crystallised limestone is the matrix in which the ruby corundum is formed. By the constant abrading effects of weather, these igneous rocks have been worn down in the ordinary way, the debris forming the gravel beds lying in the valley basins below. It is in these gravels that the finest rubies are found, and the reason would appear to be that, in running the gauntlet of the continual grinding and pulverising processes carried on by Nature, those crystals of corundum which are weak in structure, and open to wear and splitting, are broken up and destroyed, leaving only the flawless and perfect to survive.

The Burmese exhibit great skill and ingenuity in mining and washing the ruby gravel. In the dry season, pits about 25 feet deep are worked by means of baskets lifted to the surface by balancing poles, but in the rainy season the miners resort to trenches cut in the hill side.

—The BALAGHAT MYSOORE MINES (LIMITED) has sold the gold obtained during the month of March, which realised £1678 11s. 4d.

MINING NOTES.  
HOME, COLONIAL, AND FOREIGN.

TELEGRAPHIC advices received from Johannesburg by the Union Steamship Company (Limited) state that the gold crushings on the Witwatersrand fields for the month of April realised 168,745 ounces, being an increase of 3373 ounces over that of March, 1894, the previous largest. The following table, taken from the circular issued by the Mining Department of the South African Trust and Finance Company (Limited), gives the crushings to date.

	1889	1890	1891	1892	1893	1894
Jan. dwt.	25,505 12	35,005 15	52,205 2	81,551 8	103,374 0	149,814 0
Feb.	22,456 18	36,837 5	50,079 2	86,849 8	93,252 0	151,870 0
March	27,919 0	37,780 2	52,949 1	94,441 11	111,474 0	165,372 0
April	27,028 16	38,636 19	55,371 16	95,562 6	122,053 0	169,745 0
May	35,028 7	38,836 5½	54,673 1	99,436 6	116,911 0	—
June	30,877 13	37,419 10	56,861 1	101,252 3	122,907 0	—
July	31,091 2	39,453 14	54,924 1½	110,791 1	126,169 0	—
August	30,519 14	42,363 11	59,073 4	102,332 3	136,069 0	—
September	34,143 10	45,435 19	65,601 15½	107,851 3	129,595 0	—
October	32,214 6	45,249 17	72,793 8	112,167 3	138,598 0	—
November	33,721 16	46,782 18	73,393 15	108,794 15	138,640 0	—
December	39,050 11	50,352 5	80,312 11	117,748 17	148,357 0	—
Total	369,557 5	494,917 0¼	729,237 12½	1,210,868 16	1,478,473 0	635,801 0

The amount of gold produced in the year 1887 was 23,155 ounces 8 dwts. Complete monthly totals were not recorded in that year.

THE difficulty in making a living on the White Cliffs opal fields, appears, from the accounts of Messrs Manners and McLean, to be not so much on account of the scarcity of the gem as because of the system of buying opal. They say that the system of buying opal is little better than robbery, men being paid only a few shillings for gems worth as many pounds.

THE South Australian Register says that the Block 14 Mine cross cutting at No. 4 level of the main shaft is being continued, and as soon as the west wall is reached drives will be put in north and south on the lode. The cross cut is now in 20 feet, with the face in sulphide of excellent grade. The sulphide prospects here are most promising. At No. 3 level a connection has been made between the main and south shafts, the total length of the connecting drive being 470 feet. At No. 2 level the cross cut east, designed to intercept the continuation of the body known in the Proprietary Mine as Darling's lode, has now been carried in over 200 feet, but the face is still in country rock. Good progress is being made with the erection of the concentrating plant, which it is expected will be ready for work by the middle of next month.

We learn from the Broken Hill Age that the course of prospecting operations at the British Broken Hill Mine, which has been authorised consequent on the recent visit of inspection by Mr. Woodhead, Adelaide director, is now in full swing, a number of tributaries who ceased work in consequence of the stoppage of tributaries having been started on this class of work. A large amount of work will be done in the neighbourhood of Retalick's shaft. In this portion of the mine the north east drive off No. 1 west cross cut will be carried on to connection with No. 2 west cross cut, and the north east drive off the latter cross cut will be carried on to No. 3 west cross cut, thus completing a series of connections, which, besides exploring the intermediate country, will ensure perfect ventilation in the locality. From the end of No. 2 west cross cut a winze will be sunk 90 feet to test the sulphides below. The east cross cut from the plat at the 200 feet level of Blackwood's shaft, which is now in about 25 feet, has passed through about 20 feet of good sulphides; the top of the drive has now passed out of the ore, although the bottom still contains sulphides. In the far north stope the north drive off the winze has been carried in about 25 feet, at which distance it has come in contact with the hanging wall.

The output of gold for the whole Zoutpansberg district for 1893 was as follows:—

	Ounces.	Dwts.	Grains.
First nine months	6187	3	2
October	932	12	0
November	1346	10	0
December	1332	4	3
Total	9798	9	2

On April 2 about 140 lbs. of ore from Mount Pleasant Gold Mine (Toy's) was roughly treated with the Panklast machine at Adelaide, and the result was eminently satisfactory, about 9 lbs. 4 ounces avoirdupois of fine and flakey gold being left in the pan after the process. The remaining portion of a parcel sent down will be forwarded to the Government battery at Blumberg for treatment by means of the cyanide process.

A TELEGRAM, dated Perth, May 5, states that in the Coolgardie goldfields the water famine is becoming very serious; news, however, had been received that good water had been struck at Bayley's Reward Mine, giving 12,000 gallons a-day.

In consequence of the reported discoveries of gold, at the old Broken Hill Surprise lease and elsewhere in the neighbourhood, and the scene at present recalls similar scenes in the early history of Broken Hill, when it was in many instances only necessary to drive a peg into the ground to start a feverish crowd of amateur prospectors doing likewise. Leases have been marked out from North Broke Hill to the Four Mile, a distance of nearly five miles.

PAYABLE alluvial gold is said to have been found at Wallenbeu, near Murrumburrah. The sinking is from 4 feet to 18 feet, the wash being 4 inches to 12 inches thick. Nearly 100 men are at work, who pay to the owners of the land a royalty of 25 per cent. on all gold won.

THE following are the totals and averages from the Witwatersrand Chamber of Mines monthly gold output analysis for March:—From mill: Total tons milled, 236,385; total number of stamps, 2315; average days milling, 27.70; average tons per stamp per day, 3.65; total yield, 110,059 ounces; average yield per ton, 9.31 dwt.; total value, 396,330; average value per ton, £1 14s. 2d. From concentrates: Total yield, 5976 ounce 16 dwts.; total value, £22,865. From tailings: Total tons treated, 204,421; total yield, 44,664 ounces 6 dwts.; average yield per ton, 4.37 dwts.; total value, £133,731; average value per ton, 13s. 1d. Grand total of value, £569,295; grand total output, 165,372 ounces.

THE coal exported from Northumberland and Durham to home and foreign ports during the four months of the present year has amounted to nearly 6,000,000 tons, and is 862,360 tons more than in the corresponding period of last year. The shipping of coal from Hull during the same period shows an increase of 57,778 tons.

## THE METAL MARKETS.

## LONDON METAL MARKET.

THE METAL MARKET—LONDON, MAY 11, 1894.

## Copper.

THERE has been good buying of G.M.B.'s, this week, chiefly of spot lots, and the market has improved and closes firm at the best. Consumers' copper and manufactured copper are in better demand and prices are harder. The American market does not show any change, and only moderate quantities are offered or sold from there at about the proportion of our prices. Business in G.M.B.'s was done on Monday at £39 8s. 9d. up to £39 11s. 3d. for s.c., and £40 for three months, and on Tuesday £39 13s. 9d. and £40 1s. 3d. respectively were paid. Wednesday brought a further advance of 3s. 9d. per ton, and at the close yesterday evening there were buyers at £39 17s. 6d. s.c., after £39 18s. 9d. had been paid for s.c. To-day the exchange was only open in the morning, and £40 1s. 3d. was recorded for spot. The market closes firm at £40 to £40 1s. 3d. s.c., and £40 8s. 9d. to £40 10s. three months. In furnace material we hear of sales of Copiapo and Portuguese ores at 7s., and Mexican ore at 7s. 3d.

## Tin

opened fairly steady with business at £71 15s., and £71 12s. 6d. s.c. Straits, and £72 5s. s.c. Mount Bischoff; the day's turnover amounting to 270 tons. On the following day £72 5s. was paid for spot, and £72 7s. 6d. on Wednesday. The tendency was thus at first slightly upward, but there is no well-defined movement or feature of any kind to report. Yesterday's market brought a relapse to £72 s.c., and to-day, after transactions at £71 17s. 6d. s.c., £72 15s. and £72 17s. 6d. three months, the market closes quiet at £71 17s. 6d. to £72 s.c., and £72 12s. 6d. to £72 15s. three months. In the Dutch market Billiton opened at 43½ fl. s.c., and 43½ fl. three months, and rose to 43½ fl., and 44 fl. respectively, closing at 43½ fl. and 43½ fl.

## Pig Iron.

Scotch shipments last week were 5259 tons, or 1707 tons under those of the parallel period of last year. The Glasgow market was closed on Monday. On Tuesday it opened at 42s. 2d. s.c. Scotch, and declined to 41s. 9d. on Wednesday, and 41s. 6d. on Thursday, recovering to-day to 41s. 11d., and closing with buyers thereat. Hematite is quoted 43s. 3d., and Middlebrook 35s. 7d.

## Lead

closes rather firmer at £9 1s. 3d. to £9 2s. 6d. soft foreign, and £9 2s. 6d. to £9 3s. 9d. English.

## Spelter

is an inactive market, and the final values are £15 12s. 6d. ordinaries and £15 15s. to £15 17s. 6d. special.

## Antimony

is dull at £34.

## Quicksilver

continues firm at £6 first and £5 19s. seconds.

The following are to-night's (May 11) prices of metals:—

	Copper.	£ s. d.	£ s. d.
Tough cake and ingot	...	42 2 6	42 15 0
Best selected	...	42 15 0	43 15 0
Sheets and sheathing	...	50 10 0	51 10 0
Flat bottoms	...	53 10 0	54 10 0
Chill bars	...	40 0 0	40 8 8
Good merchantable	spot, & 3 months respectively	40 0 0	40 8 8
Copper tubes, seamless	...	—	0 0 7½
Alloys.			
BRASS: Wire	...	—	0 0 5½
Tubes (solid drawn)	...	—	0 0 5½
Sheets	...	—	0 0 5½
PHOSPHOR BRONZE: Alloys II.	...	—	88 0 0
" III. or V.	...	—	93 0 0
" VII.	...	—	95 0 0
" XI.	...	—	90 0 0
" Vulcan brand A1 B.O.	...	80 0 0	85 0 0
DURO METAL	...	80 0 0	85 0 0
BULL'S METAL	...	80 0 0	85 0 0
Ferrobronze (Vivian's).			
Ingots	per lb.	0 0 5½	—
Ordinary sheets, plates, bolts and bars	...	0 0 6½	—
Screw bolts and nuts	...	0 0 8½	—
Pump rods, plain	...	0 0 7½	—
finished	...	0 0 10½	—
DELTA METAL: No. 4 (per ton)	...	—	73 10 0
Sheets and plates (per lb.)	...	0 0 9½	—
Bars, round, square, flat (per lb.)	...	0 0 9½	—
" hexagon (per lb.)	...	0 0 9	—
Tin.			
English, ingots, f.o.b.	...	76 0 0	77 0 0
bars	...	77 0 0	78 0 0
refined	...	78 0 0	79 0 0
Straits, spot and 3 months respectively	...	71 17 6	72 12 6
Australian spot, and three months respectively	...	72 10 0	73 5 0
Banco (in Holland)	...	76 7 6	76 10 0
TIN PLATES: Charcoal, best quality	per box	0 14 0	0 15 0
ordinary	...	0 11 3	0 12 0
Coke, best quality	...	0 10 6	0 11 0
ordinary	...	—	0 10 0
Iron.			
Fig. G.M.B., f.o.b., Clyde, spot	...	—	2 11½
Scotch pig, No. 1 Gartsherrie	...	—	2 11 0
" Coltness	...	—	2 10 0
" Clyde	...	—	2 9 0
" Govan	...	—	2 8 0
Bars, Welsh, f.o.b. Wales	...	—	5 2 6
Plates	...	—	6 0 0
Bars, Staffordshire, at works	...	—	5 7 6
Sheets	...	—	6 10 0
Plates	...	—	6 7 6
Hoops	...	—	5 15 0
Ship plates, Middlesborough	...	—	4 18 0
STEEL: English spring	nominal	—	20 0 0
cast	according to quality	25 0 0	60 0 0
Halls at works, according to section	...	3 12 6	5 5 0
Lead.			
Spanish or soft foreign	...	9 1 3	9 2 6
English pig, common	...	9 1 3	9 3 9
L.B.	...	—	9 15 0
sheet and bar	...	—	10 2 6
pipe	...	—	10 12 6
red	...	—	12 0 0
white	...	—	16 0 0
patent shot	...	—	13 10 0
Spelter.			
Silesian ordinary brands	...	—	15 12 0
special brands	...	15 15 0	15 17 6
English Swansons	...	18 5 0	18 7 6
Sheet Zinc	...	18 10 0	18 15 0
Antimony.			
Antimony	...	—	34 0 0
Quicksilver.			
Flasks, 75 lbs. warrants	...	5 19 0	5 19 6
Ore, c.i.f., U.K. ports	per unit.	—	—
1st quality, 50 per cent. and upwards	...	0 0 10½	0 0 11½
2nd " 47 per cent. to 50 per cent.	...	0 0 9½	0 0 10½
3rd " 40 " 47 per cent.	...	0 0 8	0 0 10
Aluminium.			
98-99½ per cent. (guaranteed 98 per cent. min.) in ingots (1 cwt. lots)	per lb.	—	0 2 0
do	do	—	0 11
Nickel.			
98-99 per cent. guaranteed	...	0 1 7½	0 1 8½

THE MYSOORE WEST GOLD COMPANY (LIMITED) AND THE MYSOORE-WYNAAD CONSOLIDATED GOLD MINING COMPANY (LIMITED).—At extraordinary general meetings of the Mysore West and Mysore-Wynad Companies, held at the offices of these companies, the resolutions for their reconstruction, which were previously adopted unanimously by the shareholders on April 23 and by the debenture-holders on the 7th inst., were on Wednesday unanimously confirmed.

—The OOREGUM GOLD MINING COMPANY OF INDIA (LIMITED) has sold the gold obtained in March for £24,228 4s. 9d.



**ABBREVIATIONS AND REFERENCES.**—The following are the significations of the abbreviations and references which occur in the Share List:—*Ay.* Antimony; *A.* Arsenic; *Bl.* Blende; *Bx.* Borax; *C.* Copper; *D.* Diamond; *G.* Gold; *I.* Iron; *L.* Lead; *M.* Muriate; *N.* Nitrates; *P.* Phosphates; *Q.* Quicksilver; *R.* Ruby; *S.* Silver; *S-L.* Silver-lead; *Sul.* Sulphur; *T.* Tin; and *Z.* Zinc. \* in the "called up" column of British Mines, signifies that the mine is conducted on "Book B" principles; † in the "Head Office" column of African Mines, signifies that the address given is not that of the head office, but of a sub- or transfer office and ‡, following the names of African mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

<sup>1</sup> The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time, as occasion requires. Every effort is made to ensure accuracy, and Secretaries of Companies, Share dealers, and our readers generally, are cordially invited to co-operate with us to this end, by notifying us of any errors that may at any time occur. We desire it to be understood that, while our Share List will almost invariably be found correct; we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

EUROPEAN KINGDS.												
Antilles .....	L	36	36	36	2	0	-73 Sept. '32	2	0	25,0	Spain .....	6, Queen-street-place
Argentina .....	C	1	0	1	0	0		1	0	133,165	Corsica .....	16, Philpot-lane.
English Cr. Specier	—	—	—	—	1	0	5% Dec. '32	1	0	84,000	Lombardy .....	9, Queen-street-pl
Fortuna .....	L	36	36	36	2	0	-78 Sept. '32	2	0	25,000	Spain .....	8, Queen-street-place
Gabins .....	C	3	3 3/4	3 3/4	5	0	5/- Mar. '34	5	0	60,470	Italy .....	Dashwood Ho., E.C.
Gmar .....	L	3 3/4	3	3 3/4	5	0	4/- May, '34	5	0	14,998	Spain .....	6, Queen-street-place
Garbella .....	J	57/-	68/-	58/-	10	0	8/- Mar. '33	10	0	25,000	Spain .....	78, Queen Victoria-l
Gason & Barry .....	C	2 1/2	2 1/2	2 1/2	5	0	2-3 May. '34	5	0	185,172	Portugal .....	87, Cannon-street.
Gee & Co. ....	G	—	—	—	5	0	—	5	0	117,240	Norway .....	6A, Austin Friars.
Gentare .....	G	2/-	2/6	3/6	3	0	—	3	0	67,000	Italy .....	5-7, Queen-street-pl.
Gen' Phone .....	L	—	—	—	30	0	11/5 Dec. '33	20	0	14,000	France .....	4-7, Queen-street-pl.
Gio Linto .....	C	14 1/2	14 1/2	14 1/2	10	0	7/- Apr. '34	10	0	325,000	Spain .....	20, St. Swithin's-lane
Gio (Worl. Bonds)	—	163	164	164	100	0	5% Apr. '34	100	0	2,165,960	Spain .....	20, St. Swithin's-lane
Gio (Ind. Co.) .....	—	162	162	162	100	0	5% Apr. '34	100	0	1,177,100	Spain .....	20, St. Swithin's-lane
Gipani .....	C	9/6	9/6	9/6	1	0	—	1	0	80,000	Spain .....	105, Bishopsgt.-st. Wn.
Gipani .....	C	9/6	9/6	9/6	1	0	—	1	0	80,000	Spain .....	105, Bishopsgt.-st. Wn.
Gipani .....	C	49 1/2	49 1/2	49 1/2	2	0	12 1/2 % Mar. '34	2	0	625,000	Spain .....	105, Bishopsgt.-st. Wn.
Post Russian Pr.	—	—	—	—	10	0	8% Mar. '34	10	0	6,480	Germany .....	Walbrook Ho., E.C.
Post Russian Pr.	—	—	—	—	10	0	8% Mar. '34	10	0	14,080	Germany .....	Walbrook Ho., E.C.



Name.	Closing Price, May 11, 1894.	Closing Price, May 4, 1894.	Par.	Latest Dividend.	Called up Per Share.	Shares Issued.	Situation of Mine.	Head Office.	Name.	Closing Price, May 11, 1894.	Closing Price, May 4, 1894.	Par.	Latest Dividend.	Called up Per Share.	Shares Issued.	Situation of Mine.	Head Office.
Lock.....G	1/8 1/8	2/8	1 0	—	£ s. d.	57,404	De Kaap .....	11, Queen Vic.-st.	Pitge Peak, New G	3/ 4/	4/	1 0	—	£ s. d.	230,328	Swaniland .....	6, Queen-street-nl.
Leo.....G	5/8 5/8	—	1 0	30% Apr. '94	1 0	30,000	Witwatersdrd. ....	8, Old Jewry, E.O.	Potchefstroom .....	1/8 2/8	2/8	1 0	—	0 18	161,000	Potchefstroom .....	19, Bury-st., E.O.
Pers.....G	3/8 3/8	—	1 0	10% Jan. '93	1 0	100,000	Witwatersdrd. ....	29, Holborn Viaduct	Princess Estate G	1/8 1/8	1/8	1 0	—	1 0	72,048	Witwatersdrd. ....	33, Cornhill, E.O.
Polfontein ..G	19 13 1/2	32 1/2	1 0	—	1 0	150,000	Witwatersdrd. ....	8, Old Jewry.		1/8 1/8	1/8	1 0	—	—	—	—	—
Polfontein ..G	2/ 3/	1/9	1 0	—	1 0	150,007	Transvaal .....	110, Cannon-street.	Randfontein .....	13/9 14/3	16/	1 0	—	1 0	1,986,500	Witwatersdrd. ....	59, Holborn Viaduct.
Polfontein ..G	4 15/8 16/8	16/	1 0	—	1 0	250,000	Witwatersdrd. ....	19, Bury-street, E.O.	Read's Drift .....	3/ 3/	10/	1 0	—	—	50,000	Transvaal .....	19, Finsbury-circus.
Polfontein ..G	4 15/8 4 1/4	4 3/4	3 0	12 1/2% Mar. '94	1 0	467,000	Witwatersdrd. ....	59, Holborn Viaduct.	Robinson .....	5 1/8 5 1/8	5 1/8	5 0	4 1/2 June '93	5 0	543,750	Transvaal .....	55, Holborn Viaduct.
Polfontein ..G	3/ 3/	3/	2 6	—	1 0	384,233	Lydenburg .....	110, Cannon-street.	Rodepoort Un. G	2 1/2 2 1/2	2 1/2	1 0	—	1 0	100,000	Witwatersdrd. ....	Wormfont-circuit.
Polfontein ..G	9/8 10/8	11/8	1 0	6% Mar. '90	1 0	344,093	Witwatersdrd. ....	8, Old Jewry.	St. Augustine .....	—	—	1 0	—	1 0	465,800	Grigoland W	30-1, St. Swithin's-lane.
Reef.....G	1 1/2 1	1 1/2	1 0	—	1 0	300,000	Witwatersdrd. ....	Witwatersdrd. ....	Salisbury New .....	2 1/2 2 1/2	2 1/2	1 0	—	1 0	98,000	Witwatersdrd. ....	1, Crosby-square.
Reef.....G	9/8 10/	11/	1 0	—	1 0	96,000	Mosambique .....	2, Pincer-court.	Sheba .....	28 1/2 27 1/2	28 1/2	1 0	-/6 April '94	1 0	614,450	Lydenburg .....	1, Crosby-square.
Reef.....G	6/ 7/	8/6	1 0	—	1 0	146,000	Witwatersdrd. ....	4, Lotherby.	Slater .....	3 1/2 3/9	4/	1 0	—	1 0	625,000	Zoutpanberg .....	4, Sun Court, E.O.
Reef.....G	9 1/2 10	10 1/2	1 0	—	1 0	75,500	Witwatersdrd. ....	31, Cornhill, E.O.	Stimmer & Jack .....	6 1/2 7 1/4	7 1/4	1 0	10% Nov '93	1 0	85,000	Witwatersdrd. ....	33, Cornhill.
Reef.....G	5 1/2 5 1/2	5 1/2	1 0	25% Dec. '93	1 0	71,687	Witwatersdrd. ....	1, Crosby Square.	S.A. Gold Trust .....	17/6 18/6	19/6	1 0	10% April '93	0 10	220,000	South Africa .....	8, Old Jewry.
Reef.....G	—	—	1 0	—	1 0	45,000	Witwatersdrd. ....	Warnfont-circuit.	Spitzkop (New) G	2/9 3/	3 1/2	1 0	50% May. '93	0 19 6	144,531	Lydenburg .....	15, Bishopsgt-st. Wt.
Reef.....G	7/9 8/3	7/8	1 0	—	1 0	300,000	Witwatersdrd. ....	Kimberley.	Stanhope .....	11 1/2 11 1/2	1 1/2	1 0	—	0 18	280,000	Zoutpanberg .....	3, Budge-row, E.O.
Reef.....G	8/ 9/	9/	1 0	-/4 May '90	0 15	120,000	De Kaap .....	Warnfont-circuit.	Sutherland E. ...G	4/3 4/9	4/8	1 0	—	1 0	98,000	Witwatersdrd. ....	8, Old Jewry.
Reef.....G	4/ 5/	5/	1 0	—	0 15	120,000	De Kaap .....	8, Old Jewry.	Tauton .....	12/ 13/8	12/9	1 0	-/8 Oct. '93	1 0	439,985	Witwatersdrd. ....	Broad-st. House, E.O.
Reef.....G	—	—	1 0	—	0 15	120,000	De Kaap .....	8, Old Jewry.	Trans. Col Trust .....	10 1/8 11 1/8	1 1/8	1 0	—	1 0	285,100	Transvaal .....	76, Old Broad-st. E.O.
Reef.....G	—	—	1 0	—	0 15	120,000	De Kaap .....	8, Old Jewry.	Trans. Est. & Dev.	1 1/2 1 1/2	1 1/2	1 0	1/ Dec. '93	1 0	280,000	Transvaal .....	St. Paul House, E.O.
Reef.....G	—	—	1 0	—	0 15	120,000	De Kaap .....	8, Old Jewry.	Trans. Gold .....	1 1/2 1 1/2	1 1/2	1 0	—	0 15	169,999	Transvaal .....	33, Cornhill.
Reef.....G	—	—	1 0	—	0 15	120,000	De Kaap .....	8, Old Jewry.	Trans. Land (15/-)</								

the State of Maine that it is not worth while going any further. That beyond this point the smiles of Nature must be few indeed, that crops must abound, and the region of eternal snow and ice be close at hand. So general is this opinion that the warmest

\* We shall be obliged if Secretaries or other Officials of Mining, Railway and other Companies will be good enough to advise us as early as possible of the date, time and place of their forthcoming meetings—whether statutory, semi-annual, annual, general or extraordinary, confirmatory or otherwise—in order that particulars may be announced for the benefit of our subscribers and more particularly our country readers. Balance sheets, reports and other matter to be submitted at such meetings should, where possible, accompany the intimations of the meetings sent

**PRINCE OF WALES.**—S. Roberts and J. Prowse, May 9: The drivage of the crosscut north at the 193 fathom level is being vigorously pushed on as rapidly as possible. The nature, formation, and character of the ground for the productiveness of the lode when reached is all that can be desired, being composed of a very congenial killas, in which are floors of highly mineralised capel and snow, and the water continues to issue from ahead.

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Name of Company.	Date.	Nature of Meeting.	Place.	Time.
Mexican Railway	May 16	General	Cannon-street	1.0 p.m.
Panulillo Copper Company.	May 18	General	Cannon-street	3.0 p.m.



**WHEEL FRIENDLY.**—May 8: In the 84 fathom end driving east of crosscut on the flat lode, the lode in the present is of the same character and value as last reported on; worth for tin, £10 per fathom. In driving east on the Pink lode the lode is 5 feet wide, with several small branches of tin running through it. To all appearance we are near a rich deposit of tin.—(Signed) N. Vivian.

**WEARDALE LEAD.**—Report on Weardale Company's mines for week ending 5th May:—Groverake: Firestone drift east, strong sparry vein, poor in ore. Forehead stopped; men raising ore in ground underfoot. Adamson's drift west strong sparry vein 3½ to 4 feet wide, worth 16 cwt. per fathom. Groverake cubic fathom stopes worth 12, 12, 14, 20, 14, 12, 14, 12, 12, and 12 cwt. per fathom.—Boltsburn: Stopes above Watt's level in vein and north and south flats worth 22, 30, 20, 26, 34, 32, 16, 28, 16, 24, 16, and 18 cwt. per fathom. All other work suspended.—Greenlaws: Nattrass Gill drift stopes worth 16, 15, 18, and 16 cwt. per fathom. Lee's sump stopes worth 14 and 30 cwt. per fathom. Tribute men working in Greenlaws vein and strings have raised 29 bings for the week.—Sedling: The 64 level east has been driven 1-2 fathoms this week. Vein 3½ feet wide, chiefly fluor spar mixed with ore, worth 20 cwt. per fathom. The crosscut north at bottom of shaft is now in 14-6 fathoms. The flat is cleaner at the top, the bottom part contains quartz and fluor spar, but no ore at present. The rise to prove the lead at bottom of shaft is up 5 feet. Vein poor and hard. The stopes east and west of 64 fathom level are worth 14, 14, 16, 16, and 14 cwt. per fathom. South vein, Stobbs' drift worth 14 cwt. per fathom. Ore raised for week 84 tons. Ore dressed for week 90 tons. Ore and slag smelted for week 132 tons, producing 70 tons of pig lead.

#### COLONIAL, INDIAN, AND FOREIGN MINES.

**BONNIE DUNDEE.**—Mine managers' report for fortnight ending 24th March:—No. 7 south west level driven a further 6 feet, total east of winze 164 feet. Reef 12 inches thick, heavily mineralised. Winze sunk 30 feet, total depth 63 feet from level. Reef looks well, and some of it is heavily mineralised.—No. 8 Level, Platt: Crosscut driven 6 feet, total from shaft 172 feet. Formation is 4 to 5 feet wide, with a little mangle stone mixed through it, which may improve as it is opened up. Have started a level to the west on the formation, and have driven 5 feet. In No. 9 south west level have continued stoping at the back of crosscut. Ground is hard, with a reef 12 inches thick, showing a little gold.—New (No. 3) shaft sunk 40 feet for fortnight. Total from surface 496 feet.

**CHIAPAS.**—Mine report for fortnight ending March 31:—Providencia No. 2 west drift rise advanced 6 feet 9 inches, total 47 feet 10 inches. Assays 2 ounces 8 dwts. gold. Extracted 14 tons. Continues in good stone. Providencia No. 3 west drift advanced 9 feet 6 inches, total 29 feet 6 inches. Cut iron pyrites in breast. Santa Fe drift advanced 12 feet 2 inches, total 50 feet 10 inches. Change in character of ground—more decomposed, and showing more carbonate ore. 3 dwts. 6 grains to 2 ounces 5 dwts. gold, 3 to 14 ounces silver, and 377 to 868 per cent. copper by assays. Extracted 45 tons. Taylor No. 3 winze advanced 5 feet 6 inches, total 39 feet 3 inches. No change. Heavy thunderstorm having fallen, recommenced sinking Santa Fe winze No. 2 on the 29th inst.—Taylor No. 3 stopes: Extracted 238 tons. As stopes advance in south east corner ore is changing and becoming more of a carbonate in character. Assays gold 6 to 7½ dwts., 5 to 6½ ounces silver, 3 to 3-23 per cent. copper. Taylor north west branch or No. 2 stopes extracted 23 tons. Assays 4 to 5 dwts. gold, 4 to 8 ounces silver, and 2-5 to 3-1 per cent. copper. Continues poor. Old Providencia extracted 160 tons. Assays 14 to 18½ dwts. gold, 10 ounces silver, and 5-9 to 6-3 per cent. copper. Looking well. Santa Fe stopes extracted 237 tons. Poor. Assays 3 to 11 dwts. gold, 3 to 6 ounces silver, and 1-6 to 2-87 per cent. copper.

**DURAND GOLD MINES.**—The secretary reports: Juniata Mine: The lease which was given to work the above mine expires on June 30 next, and application has been made by the present lessee for a renewal; but this has not been granted, more especially as the lessee of two other mines, also held by the company, have written saying that if you will lease to them the Juniata mine for one year or longer, they will give a large figure per ton of ore crushed, or will make an offer of a certain amount of cash per month, giving a bond of two good securities to secure the payment, or they will undertake to mill a certain amount of ore per month. This offer has not yet been accepted, as the following letter has to-day been received by the Chairman from a former manager of Esmeralda (Limited):—"I have been hearing some reports lately that made me think it would be worth while for you to investigate matters before renewing or letting another lease of your Juniata Mine. There was a good little streak of ore showing near the surface, which I have sampled several times, and I understand that the work the present lessee has been carrying on has shown that this streak extends downwards. This portion of the ledge could be mined very cheaply from the lower tunnel on that hill, and if it could be worked at the Silver Hill mill it would not require very high grade ore to pay well. I have heard some independent reports about it, and thought I would draw your attention to it in case you were coming out."—Hancock and Garfield Mines: The lessees of these mines, under date April 8, report that they have got well to work, and will shortly have a crushing of 15 tons to 20 tons to test the quality.

**MOSMAN.**—Mine manager's report for fortnight ending March 16: North Australian Mine: Brierley level south crosscut has been further extended 15 feet, total distance from level 50 feet. The ground is very hard, and at present no indication of reef. Brierley level winze sunk an additional 10 feet, total depth 120 feet. A change is coming in, and the walls have opened. There is also a mixture of quartz and mullock, which may at any time make into a reef. Stopes: The stopes are yielding a little above the average quantity of quartz; several stopes are yielding very little indeed, but in one or two the reef is 18 inches to 2 feet thick. Stone raised during the fortnight 65 tons, total since last crushing 320 tons.—Wardham Mine: No. 13 level north driven 32 feet, total from shaft 118 feet. The reef has increased in size to 18 inches, fairly mineralised, but with little gold as yet. No. 13 level south extended 15 feet, total from shaft 100 feet. With no stone in face, driving has been temporarily stopped. No. 8 level north extended 25 feet, total from shaft 382 feet. There is no stone in this level, and driving will therefore be stopped. No. 8 level south driven 25 feet, total from crosscut 113 feet. There is no stone, and work will be discontinued. No. 12 level south winze deepened 13 feet, total depth 48 feet. Water has been met with, and has completely stopped the contractors from further work.—Stopes: Over No. 13 level south a stope, about 70 feet long, has been opened. The stone is about a foot thick, and poorer in the back than along the level. Commenced stoping from both ends of winze in No. 13 level north of shaft; the reef is 18 inches thick, worth about 1 ounce per ton. Over No. 12 level north of shaft reef varies from 6 inches to 2 feet 6 inches, worth about 10 dwts. per ton. Over No. 11 level south reef is from 6 inches to 18 inches thick, worth 15 dwts. per ton. Over No. 9 level the reef has pinched, varying from 3 inches to 12 inches, worth about 18 dwts. per ton. Over No. 2 level south reef is 12 inches thick, worth about 10 ounces per ton.—Stone crushed: The last clean-up of 294 tons yielded 295 ounces 13 dwts. 6 grains of gold. The stone since put through the mill is very poor, judging from the amalgam obtained.

**MYS-BE WYNNAID AND MYRORE WEST.**—The following summary, received by mail from the mining manager in India, shows the work done during the first fortnight of the month of April:—Workings: North shaft 350 south No. 4 crosscut west, ground out 16 feet 6 inches. 350 south No. 3 crosscut east, ground out, 16 feet. South shaft ground out, 5 feet. 354 south crosscut west, ground out, 15 feet 6 inches. 354 north, ground out, 14 feet; size of lode 1 foot 6 inches; assay value, 1 ounce 8 dwts. 354 north stope, ground out, 6 feet; size of lode, 4 feet; assay value, 19 dwts. Total, 73 feet.

**NO. 7 NORTH EAST QUEEN.**—The following fortnightly report has been received from the mine, dated Charters Towers, March 16: During the fortnight Gonion and party have crushed 26 tons for 25 ounces 14 dwts. of smelted gold, from the stulls over No. 3 level. Roberts and party have got about 40 tons of crushing stuff during

the fortnight from the stulls below No. 3 level. Perry and party, under No. 3 eastern level, have from 12 to 20 inches of good mineral stone in the face, for a distance of 20 feet. Tonkin and party are working on a small block over No. 3 west level, which they expect to finish next week. Hall and party are still working on about 6 inches of stone, under No. 1 west level. Total amount of stone raised from the different parties during the fortnight, 45 tons.—(Signed) H. Davis.

**NINE REEFS.**—Fortnightly report of Captain John Woolcock, mine agent, dated 18th April: Vyvyan's Shaft: This shaft has been further deepened 8 feet 2 inches, total depth below the 380 feet level 69 feet 4 inches. Since my report of the 4th inst. the lode formation has increased in size, and is now from 3½ to 4 feet wide. Against the hanging wall there is a vein of pyrites varying from ½ inch to 1 inch wide, and the concentrates from this give by assay 17 ounces of gold per ton, but it shows no free gold in pan washing. The remainder of the lode is composed of schist, carbonate of lime, and small patches of quartz, but of no value. The walls are more defined, and the lode stuff is of a more promising appearance.—Bennett's Shaft: The crosscut west at the 145 feet level to the north of this shaft has been driven 23 feet 3 inches, total distance from the level 212 feet 2 inches. Nothing of importance has been met with since my report of the 4th inst., but the strata through which we are passing is of a promising character and letting out water. This crosscut is proving the ground to the west of our workings, and the fact of its letting out water I consider is a good sign, and trust that something of value will soon manifest itself.—South Shaft: This shaft has been further sunk 4 feet 5 inches, total depth from surface 111 feet. There is no change to report in the character of the ground since my last, and the quantity of water is about the same. For the first week we had a good deal of hindrance through the timbering of the bottom part of the shaft, which will account in a great measure for not more ground being sunk, but now we are drawing the water and stuff with the engine much better progress will be made. The west side of the shaft is still heavy, and will have to be timbered as we go down.—Prospecting on the lode 400 feet west of Malleison's: The shaft sinking at 60 feet from our southern boundary (and which in future will be known as No. 1 shaft for simplicity in reporting) has been sunk 34 feet 6 inches. This is the first measurement from surface. The lode for this depth has varied from 1 foot to 18 inches wide. At present it is 15 inches wide, composed of decomposed schist, veins of quartz, and oxide of iron, and carrying a little pyrites. We take a sample every day, and they all show a fine trace or colours of gold in pan washing, which is cheering so near the surface. The No. 4 shaft on this lode has been sunk 12 feet 9 inches, depth from surface 72 feet 9 inches. The lode here is 9 inches wide, and ground rather hard. The samples from this shaft show occasional colours of gold in pan washing.—Surface: All our surface operations with machinery, pitwork, &c., are going on satisfactorily, and do not call for remark.—Health: The health of the camp continues good.

**NUNDYDROOG.**—F. W. Grey, April 18: Report of the work done for the first fortnight of the present month: Taylor's shaft sunk 10 feet, total depth 1042 feet. We also cut cistern flat and fixed cistern below the 1000 level. The lode averages fully 9 inches in width for the whole length of the shaft, and the assay value is 8 dwts. 18 grains per ton. 1000 foot north driven 38 feet, total length 388 feet. The lode is still small, 3 inches in width, and assaying 5 dwts. 12 grains per ton. 1000 south driven 30 feet, total length 177 feet. The quartz is still of comparatively low value, assaying 7 dwts. 12 grains per ton, but the lode has opened out considerably, and is now fully 2 feet wide. 920 north from winze driven 36 feet, total length 45 feet. The quartz is 1½ foot wide, and assays 1 ounce 12 grains per ton. 840 north No. 3 winze sunk 17 feet, total depth 33 feet 6 inches. The lode is improving here, and is now 3½ feet wide, and assays 1 ounce 2 dwts. 18 grains per ton. 840 north stope in back, ground stopped 13 fathoms in a lode 3 feet wide, assaying 14 dwts. per ton. 760 north back stope, ground stopped 8 fathoms in a lode 3 feet wide, assaying 15 dwts. per ton. 680 north driven 33 feet, total length 155 feet. The ends still very hard. We are now lengthening the Main shaft between the 760 and 840 levels.—Kennedy's shaft: Depth 521 feet. We have just resumed sinking here. 520 north crosscut west driven 20 feet, total length 33 feet. We passed through what appeared to be the lode about 24 feet from the shaft, but as it was somewhat mixed with country we put the crosscut out a few feet further to see if we could find anything more encouraging further west. As there was nothing there, however, we came back and commenced to drive on the branch intersected; the drive is now in 4 feet, and the quartz is 6 inches wide, assaying 6 dwts. 12 grains per ton. 440 north driven 41 feet, total length 384 feet; the lode looks very well, being 4 feet wide and assaying 18 dwts. per ton. 440 south driven 38 feet, total length 264 feet; the lode is opening again, and is now 1 foot wide, assaying 12 dwts. per ton. 440 north stope in back ground stopped 25 fathoms in a lode 5 feet wide, assaying 1 ounce 3 dwts. 18 grains per ton. 370 south rise in back risen 8 feet, total height 29 feet, when we holed north shaft. 300 south crosscut west driven 19 feet, total length 22 feet; the end is very hard. North shaft sunk 20 feet, total depth 334 feet, and holed the 370 rise; we shall go on sinking as quickly as possible. The drives, stopes, &c., working by hand labour are as follows:—920 north drive lode 9 inches wide, assaying 6 dwts. 12 grains. 920 south drive lode 5 inches wide, assaying 4 dwts. 6 grains. 680 north rise and stope lode 1 foot wide, assaying 9 dwts. 18 grains. 680 north No. 1 winze lode 2 inches, assaying 3 dwts. 6 grains. 680 north No. 1 bottom stope lode 1 foot wide, assaying 10 dwts. 18 grains. In the 680 north No. 1 back stope the lode is 2 feet wide, assaying 8 dwts. 18 grains. 680 north No. 2 back stope, lode 9 inches wide, assaying 9 dwts. 6 grains. 600 north No. 1 bottom stope, lode 1 foot 6 inches wide, assaying 12 dwts. 600 north No. 2 bottom stope, lode 2 feet wide, assaying 13 dwts. 600 north No. 3 bottom stope, lode 1 foot wide, assaying 1 ounce 9 dwts. 6 grains. 600 north No. 4 bottom stope, lode 9 inches wide, assaying 6 dwts. 12 grains. 600 north No. 5 bottom stope, lode 1 foot wide assaying 10 dwts. 600 north No. 6 bottom stope, lode 1 foot wide, assaying 7 dwts. 12 grains. 600 north No. 1 back stope, lode 9 inches wide, assaying 10 dwts. 18 grains. 600 north No. 2 back stope, lode 6 inches wide, assaying 9 dwts. 18 grains. 520 north No. 1 bottom stope, lode 1 foot 6 inches wide, assaying 15 dwts. 520 north No. 2 bottom stope, lode 1 foot 6 inches wide, assaying 12 dwts. 520 north No. 3 bottom stope, lode 1 foot 3 inches wide, assaying 10 dwts. 18 grains. 520 north No. 1 back stope, lode 1 foot 3 inches wide, assaying 17 dwts. 6 grains. 420 north No. 2 back stope, lode 1 foot wide, assaying 10 dwts. 520 north No. 3 back stope, lode 10 inches wide, assaying 14 dwts. 370 north, No. 1 back stope, lode 1 foot wide, assaying 11 dwts. 6 grains.—Kennedy's: 95 north, No. 1 bottom stope, lode 2 feet wide, assaying 17 dwts. 12 grains. 95 north, No. 3 bottom stope, lode 1 foot 6 inches wide, assaying 10 dwts. 18 grains. 160 north, No. 1 back stope, lode 6 inches wide, assaying 1 ounce. 160 north, intermediate, lode 4 inches wide, assaying 12 dwts. 160 north, intermediate, No. 1 winze, lode 4 inches wide, assaying 6 dwts. 12 grains. 300 south, No. 1 rise and stope, lode 3 feet wide, assaying 9 dwts. 18 grains. 300 south, No. 2 back stope, lode 1 foot wide, assaying 9 dwts. 300 south, No. 3 back stope, lode 1 foot 6 inches wide, assaying 17 dwts. 12 grains. 300 north, No. 1 rise and stope, lode 4 feet wide, assaying 16 dwts. 6 grains. 300 north, No. 2 back stope, lode 3 feet wide, assaying 18 dwts. 12 grains. 370 north, No. 1 back stope, lode 1 foot 6 inches wide, assaying 1 ounce 12 grains.—Mills: Both mills and tailings machinery are running well.—Health: The general health of the camp is good.—Mill Samples: Old Mill Samples: Rough quartz through stonebreaker, 15 dwts.; small, 16 dwts. 6 grains; tailings, 4 dwts. 6 grains.—New Mill Samples: Rough quartz through stonebreaker, 12 dwts.; small, 10 dwts. 18 grains; tailings, 4 dwts. 12 grains.

**NEW MINERA.**—Mining report for the two weeks ending May 4: 275 yard level: Stope near forebreast west on south lode. Lode worth 3 tons blend per fathom. Stope west of No. 2 rise: Lode worth 2 tons lead ore per fathom. 295 yard level, west of winze: Four men on tribute. Lode worth 3 tons blend per fathom, esti-

mated to produce 10 tons per month. Near forebreast west: Four men on tribute. Lode worth 3 tons blend per fathom, estimated to produce 12 tons per month. 315 yard level, driving east of main crosscut: As last reported. West of incline shaft: Four men on tribute. Lode worth 3 tons blend per fathom, estimated to produce 10 tons per month. East of incline shaft: Six men stoping in the bottom of the level. Lode worth 4 tons blend per fathom, estimated to produce 20 tons per month. West of winze: Two men on tribute. Lode worth 2½ tons blend per fathom, estimated to produce 4 tons per month. East of winze: Lode worth 3 tons lead ore and blend per fathom, estimated to produce 5 tons per month. Two men on tribute. Near forebreast west: Lode worth 4 tons blend per fathom, four men on tribute, estimated to produce 12 tons per month. Dressing: 51 tons blend sent off since last report, making the total quantity sold 4044 tons blend and 1708 tons lead ore.

**NEW COLORADO.**—The directors have received the following report from our manager in Colorado:—I am pleased to be able to report that we made last month a profit of \$127-92, after paying all expenses, and correspondingly reduced the indebtedness in Colorado. The men in the Old Terrible Tunnel had a very good sale this month, their 2 tons of ore assaying 383½ ounces of silver per ton. The branch vein on which they are stoping continues fairly good.

**PESTARENA UNITED.**—W. H. Trelease, T. H. Messa, May 3 No. 1 lode: The 55 fathom level east is yielding 10 tons of ore per fathom, worth 3 ounces per ton. During the past fortnight the ore-bearing part of the lode has increased to 1 metre in width, and has every appearance of continuing. In the 70 east the lode maintains its width, and shows pyrites throughout, but there is nothing yet to value. The 70 east is temporarily suspended. The 70 west on A and B lodes yields 1 ton per fathom, worth 1 ounce. Driving has been continued at the 140 west on a branch. There is nothing new to report in the crosscuts.—Stopes: There are 11 stopes at work, averaging 4½ tons per fathom at 1 ounce 5 dwts.—Stabili: In the Anza level the lode is 90 centimetres wide, showing more quartz than formerly, but still containing small veins of pyrites throughout. In the winze below the 18 metre level south the lode is 1-10 metre wide, carrying a small branch of pyrites on the footwall.—General remarks: The excavation for the turbine has been completed, and ground is now being cut for the slides. The water is in fork to the 150 fathom level. All the machinery continues to work satisfactorily.

**SHEBA LODE EXPLORATION.**—The manager, Mr. J. Frederic Wilson, writing under date April 12, reports as follows: I am in receipt of your favour of the 16th ult., and confirm my letter of the 5th inst., and also my cable of the 10th inst., as follows: Produce trench loftily beakrons—meaning: Strike made in trench, in panning out visible gold is seen, prospects of large body of ore very good. I continued to sink one of the trenches I mentioned in my letter last week, which is situated on the crown of the hill about 540 feet to the east of the Good Hope drive (on No. 3 block), and on Monday, when about 2 feet from the surface, I selected some of the rock, crushed and panned same, and obtained visible gold. I then panned off four more samples of rock from the same trench and obtained a good prospect of visible gold each time. Since Monday I have sunk the trench 5 feet 6 inches for a length of 10 feet and panned off more rock from the bottom, which also shows visible gold. The trench is at present 60 feet long, varying in depth, and I have taken rock from both ends of same and panned it, and it shows visible gold from each place. I have also traced the outcrop of the same rock on the surface up the side of the hill, and there is apparently a large body, which I believe will also prove to carry gold. I am now opening out further trenches on the side of the hill so as to prove it here as soon as possible. The rock consists of a hard substance, some of it having a reddish brown appearance, with quartz running through it very similar to the Sheba Quarry rock. The rock has every appearance of continuing in depth, as it remains solid and looks well, but at the present time it is, of course, impossible to say if it will do so, as it is not opened up sufficiently yet to be able to form an opinion, but I think in all probability it will continue to go down.—Good Hope Drive: The rock in this working continues hard, but there is a slight change, the quartz being mixed with a good deal of felspar now, and still carrying pyrites. I base my calculation on the distance we still have to drive upon measurements taken on the ground—we may not have to drive quite so far as I have stated, as it is difficult to follow the follow the strike of the reef on the surface owing to the broken ground, but I think it will not be far out.

**SHEBA.**—The following report has been received from the general manager for the month of March:—Mine: Above No. 5 level: Two small prospecting drives were cut from No. 2 level stope north a distance of 5 feet and 7 feet respectively. The ground was found to be low grade. On No. 3 level west end a winze was sunk 10 feet to connect with the back of the No. 4 level west stope, the ground being low grade. The No. 4 level west stope continues to produce good milling ore. On No. 5 level the ore bin at collar of No. 17 winze has been fixed, as also the skiproad for ore bin to No. 6 level, and the skip has been set to work hoisting ore from No. 6 level. This makes two skips which are now being run by the electric motors. Below No. 5 level the stope on No. 6 level improved considerably towards the latter end of the month towards the east, the good shoot ore extending under the incline shaft. Very little ore is now being broken in this stope. Preparations are now being made to continue No. 17 winze down to No. 7 level.—No. 7 level: The following drives have been extended: West end of level 13 feet; No. 2 north crosscut 5 feet 6 inches; No. 3 north crosscut 8 feet in poor ground.—No. 8 level: The west end extended 6 feet 6 inches during the month, with a slight improvement in the ground. No. 2 north crosscut extended 17 feet in poor ground.—No. 9 level: A plat has been cut on each side of the incline shaft for a leading station 15 feet by 15 feet by 7 feet in good milling ore, the east end looking the best.—Incline shaft: This was sunk 2 feet 6 inches, which completes the contract; we have deemed it best to suspend further sinking for the present, so as to admit of the skip being used for hoisting from the various drives which are now being pushed forward. The incline is now down 540 feet below No. 5 level and it is in fair grade ore.—Low level tunnel: This has been extended in the five ends 201 feet, making a total of 556 feet 6 inches. The main tunnel has been connected with the incline face of the tunnel, therefore hereafter we shall be driving on only three ends. The ends are still in slate, and making a little more water.

**VICTORY (Charters Towers).**—Copy of mining manager's report for fortnight ending March 24: Drive on footwall reef at No. 6 level driven south 10 feet, total 63 feet; a little stone making in face. Stopes above 3 to 12 inches, showing more mineral. Stopes at back of drive at No. 7 south level 3 to 8 inches medium. Stopes from bottom level on south side of shaft, 12 inches, poor quality. Stopes on Papuan reef above drive on west side of cross drive average 6 inches good quality. Drive from Papuan Company's lease at their No. 6 level is in 10 feet; reef here varies from 6 to 12 inches, the quality of which is about 24 ounces per ton. Raised from No. 1 shaft 40 tons, total at surface 110 tons. No. 2 shaft, underlie sunk 12 feet, total 212 feet; carries fully 4 feet of reef of fair quality. Expect to start another drive in this shaft during the coming week. No. 5 east level driven 15 feet, total 98 feet; no reef here the last few shifts; stopes above 6 to 30 inches medium quality. Carrying an underhand stope along this drive on 30 inches fair quality. No. 4 east level winze sunk 15 feet, total 67 feet. At this depth holed through to No. 5 level. Crossdrive extended 11 feet, total 115 feet; still following fault. No. 2 west level driven 16 feet, total 372 feet; country here soft granite. Crossdrive in No. 1 west level driven 15 feet, total 84 feet. Have just passed through 12 inches of soft granite, and reached the hard country at back. No. 1a west driven 6 feet, total 66 feet, without change. Raised 420 tons.

**THE COAL STRIKE IN MORAVIA.**—Vienna, May 8. According to later advices from Moravia-Ostrian, the strike movement among the coal miners is extending beyond the Karwin portion of the coal district, and now comprises 20 pits, with a total of 9000 hands on strike. The situation is considered critical, but up to the present no disturbances have occurred.



**ALMADA AND TIRITO.**—Fortnightly report ending April 14: Dios Padre: The 350 feet level driving north is in extremely hard ground, consequently our progress is very slow, and owing to the absence of ventilation in the 350 south of Pachecos winze very little has been done; the lode is poor. The 350 feet level driving north is being driven on a wide and congenial lode. During the past fortnight we have driven a cross cut from this end through the lode—20 feet—east and west to prove it, but excepting a small branch of green ore near the eastern wall, nothing of consequence was met with. In the 250 feet level driving south the lode is poor and the ground very hard, composed chiefly of quartz. Stopes: The stopes back of the 156 feet level north of Cruz Verde and back of the intermediate below the 12 fathom level are yielding good quantities of ore.

**AUSTRALIAN BROKEN HILL CONSOLS.**—The mining manager reports by mail for the fortnight ended March 29: Block 96: Main shaft 280 level east prospecting drive No. 4 rise driven 3 feet 6 inches, total 27 feet. Bottom has been taken up, and men have resumed rising. The lode is nearly flat, without change. Incline sunk 1 foot 6 inches, total 542 feet. The water became so strong as to prevent sinking operations being continued. Have procured extra pump, which will be put in at once. Lode is dipping fast, but shows signs of rising again. A little fahlerz and cobaltite are showing. The former assaying 3719 ounces 4 dwts. 21 grains silver. No. 5 level west of incline driven 7 feet 6 inches, total 17 feet. The vein has become pinched and shows no ore. No. 5 level east of incline driven 2 feet, total 6 feet.—Cutting Chamber: Men will start driving on contract on Monday. No. 4 level east of incline driven 13 feet 6 inches, total 168 feet 6 inches. Lode well defined, composed of carbonate of iron and calcite. Fahlerz, occasionally showing a good stream of water, is coming from face of drive. No. 3 level east of incline driven 10 feet. In stopping upwards the indications were not considered sufficiently promising to warrant further exploration. Men have been transferred below level near the incline. Stopping off 280 level west driven 7 feet. Lode became poor; men have been transferred to No. 5 level east of incline. In 280 level west prospecting drive stopes below level driven 10 feet. A decided improvement has taken place here. The ore has improved in size and quality, and at present looks very promising. A bulk assay gave silver 93 ounces 18 dwts. 8 grains, lead 75.97 per cent. lead.—Note: The quantity of rock mined during the fortnight was 2232 cubic feet.

**BALAGHAT-MYSORE.**—Jos. Pryor, April 18: Ogle's shaft has been sunk 5 feet, or 10 feet below the 800 feet level. The lode is still unproductive. The 800 feet level north has only been advanced 7 feet 9 inches, or 76 feet from the shaft. The quartz varies from 1 foot 6 inches to 1 foot wide, and assays 2 ounces 18 dwts. 2 grains per ton. A stope in the back of this level produces quartz of over 1 foot wide, and assays 4 ounces 13 dwts. 8 grains per ton. The 800 feet level south from the bottom of the No. 1 winze at the 730 feet level north has been extended 5 feet, or 14 feet 6 inches from the winze. The quartz is 1 foot wide, and assays 2 ounces 19 dwts. 17 grains per ton. We had fully expected to have communicated this drive with the level from the shaft ere this, but circumstances which could not be avoided prevented our doing so; we, however, think we shall do so some time this week. The 800 feet level north, also from the bottom of this winze, has been advanced 7 feet 3 inches, or 14 feet 3 inches from the winze. The quartz is 1 foot 6 inches wide, and assays 3 ounces 6 dwts. 6 grains per ton. The stopes in the bottom of 730 feet level north produce quartz of from 6 inches to 1 foot wide, and assay on an average 1 ounce 18 dwts. 10 grains per ton. The stopes in the back of this level yield quartz of from 9 inches to 1 foot wide, and assay on an average 18 dwts. 23 grains per ton. The stopes in the bottom of the 660 feet level north produce quartz of from 6 inches to 1 foot wide, and assay on an average 19 dwts. 8 grains per ton.—Haine's shaft: During the past fortnight we have had considerable trouble with the water constantly getting in at this shaft, consequently have not yet been able to commence the driving of the new or 870 feet levels, the shaft not being yet deep enough to admit of our doing so. We are, however, hoping to start these levels during this week, when we also hope to be able to take up a lot of the water, and so be enabled to sink the shaft with greater and more satisfactory speed. The quartz in the bottom of the shaft is from 1 foot to 1 foot 6 inches wide and assays 6 dwts. 12 grains per ton. I regret to say we have had further breaks of ground in the 800 feet level south, and these naturally so blocked the level that it was impossible to work in the forebreast. I am, however, glad to say this ground has now been thoroughly secured, and not only has the level been cleared of the debris, but work has again been commenced in the end, which is now 193 feet 6 inches from the shaft; the quartz is 1 foot wide and assays 5 dwts. 14 grains per ton. The stopes in the back of this level produce quartz of from 1 foot to 1½ foot wide, and assays on an average 8 dwts. 13 grains per ton. We are now clearing the No. 1 winze in the bottom of this level of the water and stuff that fell into it on account of the falls of ground just above it, and hope shortly to resume its sinking. At the No. 2 or midway winze in the bottom of the 730 feet level south we have commenced driving (from the bottom of the winze) levels north and south; the former has been extended 4 feet 3 inches and the latter 8 feet 9 inches from the winze. The quartz in both ends is about 6 inches wide and assays 17 dwts. 17 grains and 2 dwts. 19 grains respectively per ton. The stopes in the bottom and back of the 730 feet level south yield quartz of 1 foot wide and assay on an average 8 dwts. 14 grains per ton.—Tennant's shaft: I am pleased to say we have not only completed cutting the necessary ground for the tip plat at the 350 feet level, but have also further deepened the shaft 7 feet 9 inches, or 15 feet below the level. The quartz averages 4 feet wide, and assays 7 dwts. 14 grains per ton. The 350 feet level north has been driven 13 feet, or 36 feet 9 inches from the shaft. The quartz recently has not been so wide or rich as last reported. It is, however, now again improving in size, being to-day from 15 inches to 1 foot 6 inches wide, and assays 8 dwts. 16 grains per ton. The 350 feet level south has been advanced 11 feet 9 inches, or 36 feet 3 inches from the shaft. The quartz varies from 6 feet to 3 feet wide, and assays 3 dwts. 17 grains per ton. We are making fairly satisfactory progress with the fixing of the double skiproad, and hope shortly to get it completed from the 350 feet level to the surface.

**CUMBERLAND GOLD.**—I now beg to submit my report for month of January:—Cross-cutting: After driving 35 feet in the footwall No. 4 level south I terminated crosscutting, the country growing harder as we proceeded, with an absence of any favourable indications.—No. 4 Level North: A party of tributers are raising a small quantity of ore in No. 4 level north, working on a reef varying from 1 inch to 18 inches, averaging, I think, about 1 ounce per ton. There is only a small patch of country let to the tributers between No. 2 shaft and the boundary of No. 1 north.—No. 2 Shaft: Owing to the unusual severity of the wet season, an immense quantity of water has been continuously running into the shaft, operations in the mine being chiefly confined to balling.—(Signed) Anthony Callagher.

**ORAVEN'S CALEDONIA.**—The following report has been received, dated Charters Towers, March 15: During the past fortnight No. 9 level has been extended a further distance of 10 feet by three men on wages, making a total of 189 feet from the slide. The reef in this level is 1 foot thick. In the first two stopes over this level the reef will average 10 inches, and will average 7 inches in the other three stopes. No. 8 level has been extended 7 feet by three contractors, which makes a total of 303 feet from the slide. The reef in this level is about 7 inches thick. In the first three stopes over the level the reef will average 1 foot, but will only average 8 inches in the other three stopes. The stopes over No. 7 level are still being worked with a reef averaging 6 inches. No. 6 level has been extended 4 feet by two men on wages, making a total of 332 feet from the slide. The reef in this level is about the same as last fortnight—7 inches—also about 7 inches in the stope over the level. I took the men from the winze in No. 4 level, there being nothing worth following at present, and started them to cross cut in the hanging wall side 255 feet, from the No. 4 plat to meet the reef which is in the stopes over No. 5 level, and it has been extended 4 feet since the 9th inst. The estimated haulage of quartz for the fortnight is

115 tons, making a total of 489 tons for the present crushing.—(Signed) G. Cabassi.

**DON PEDRO.**—Mine report No. 6: March 6: No. 1 stope: As pointed out in mine report for February, the working for that month showed an improvement in this part of the No. 8 shoot, and during the part of last month in which the stope was worked the improvement continued (stoped 6 feet). Nevertheless we have been obliged to suspend work in it for the amount of water, the number of men required to handle the broken mineral, and keeps the pumps going, and the trouble of getting in the sets would prevent its being payable worked even were the lode much richer than it is. The same remarks apply to stopes Nos. 2 and 4, in which we are now excavating for the last set of timber. These, as I have previously reported, are the most easterly workings on the No. 8 shoot. They are now 12 feet in advance of No. 5 stope. The lode continues good, the rich stratum near the footwall showing thicker than heretofore. Stopped for the month 6 feet. Nothing more should be done in these stopes, or in No. 1 until this part of the No. 8 shoot has been drained by the 60 cross cut and level, when the mineral can be extracted and handled with much less cost and greater speed.—Rise in No. 6 shoot: This started from No. 4 stope has passed through A stope, and is being continued towards C. No new ground is immediately opened up, the purpose of the rise being to enable us to resume the stopes on the No. 6 shoot, and to open out fresh ones. A stope, the breast of which is 6 feet east of the rise, will be restarted as soon as the set has been fixed in stopes Nos. 2 and 4. Risen since the 13th ult. 12 feet. In the lode under the No. 8 shoot the incline rise on this shoot from the north east drive at the 60 fathom horizon has been difficult to start, but so far has given no serious trouble. This difficulty was anticipated, as the amount of water must of necessity be great at first. I have every reason to hope it is satisfactorily draining the ground we intend to excavate. Risen 5 feet. A level is being driven north from the 50 fathom crosscut to meet the rise at that horizon. This had to be restarted to the west of or under the lode, which is at present in the back of the level only. The lode dips north as well as east, so we shall be breaking more mineral and less country as we advance. Driven 4 feet. 60 fathom crosscut has been driven another 18 feet, and has reached footwall of No. 8 shoot. From the appearance of the small portion seen and from samples taken the lode should be as rich as in the No. 4 stope. It is not yet possible, however, to form any definite opinion as to its quality. At least 12 feet more must be driven before we are well into the lode, and from 18 to 20 feet before the whole of the end produces mineral.—Gordon's Shaft Repairs: I have had to double the number of men at this work, as I could not with safety longer delay the retimbering of part of the shaft. From 25 fathoms below the adit down for at least 8 fathoms the whole of the timber will have to be renewed.—Pumping Machinery Transmission: On the 4th ult. the 9 feet driving sheave was repacked, and the machinery at the mouth of the mine and the shaft was overhauled. On the 11th the iron stand referred to in my report, dated 5th, was erected near the reduction house. This stand, which carries a 9 feet sheave for the driving and a 5 feet sheave for the slack side of the rope, enables us to do away with three 3 feet sheaves, which greatly increased the wear on the rope.

**HARRIETVILLE.**—Fortnightly report of Mr. T. G. Davey, superintendent, dated March 30: Mons Meg Mine: Drive south of winze on main shaft, 100 feet below tunnel D, advanced 14 feet, total 33 feet. Lode 6 feet wide, of which 1 foot assays 6 dwts. per ton. North drive at same level extended 10 feet, total 40 feet. Lode formation 8 feet wide, but very poor. Cross cut west of same drive advanced 7 feet, total 15 feet. Passed through series of veinlets carrying colours of gold. Work suspended here in order to expedite north drive.—Stopes: Lode in stopes over drive south of tunnel D, from 12 feet to 16 feet wide, and assaying from 3 to 5 dwts. per ton. Underhand stope at 290 feet level, below J, lode still extending south, 2 feet wide, and assaying 6 dwts. per ton. Underhand stope at 44 feet level, below J, lode 4 feet wide, assaying 18 dwts. per ton. Lode in stope 50 feet above tunnel J, 2 feet wide, and assaying 8 dwts. per ton. Stope on north shoot at back of tunnel J, 3 feet wide, assaying 13 dwts. per ton.—Swindle Lode: Resumed extension of tunnel towards Swindle lode. Passing through quartz leaders, with occasional colours of gold.

**MYSORE REEFS.**—Fortnightly report of Captain M. Scantlebury, mine agent, dated April 18: Underlie shaft has been sunk 9 feet, which now makes a depth of 242 feet 3 inches from surface. The lode is showing a good hanging wall with 9 inches of quartz against it, assaying 6 dwts. 12 grains of gold to the ton. We occasionally see splendid stones of gold quartz, and I am in hopes that we shall very soon see the lode much better.—Vertical Shaft: The 200 feet level north of the cross cut has been extended 19 feet, now 19 feet from cross cut. The lode has varied very much in quality. When I cabled you on the 14th inst. we had a leader of quartz against the hanging wall 9 inches wide, assaying 13 ounces 22 grains of gold to the ton. This run of quartz is now 1 foot 6 inches wide, and worth, according to a sample I panned this morning, 1½ ounce of gold to the ton. 200 feet level south of cross cut has been extended 18 feet, now 18 feet from cross cut. The lode has varied in size from 1 foot 3 inches—I mean the productive part—to 2 feet, and the assay value from 3 ounces 6 dwts. to 2 dwts. 20 grains of gold to the ton. The leader of quartz in the present end is 2 feet wide, and a sample from it this morning panned 1 ounce of gold to the ton. You will observe that we are opening out a good piece of ground with these two levels. I need not say if it continues in length for a few hundred feet that the company will have a splendid property. Trial shaft on the western run of old workings. The cross cut east to intersect the old workings on the lode has been advanced 6 feet, now 10 feet 6 inches from shaft. The water is very quick, and the rock is hard; the progress, therefore, is slow.—Erection of Stamps: The stamps engine is being erected, most of the heavy parts are in position.

**MOUNT LYELL.**—The London committee have received the following reports from the Melbourne board for week ending March 21: Engine Shaft, 100 Feet Level: The western cross cut has been advanced 3 feet, total 52 feet. The face now is pretty well all in dense hard pyrites.—Engine Shaft, 50 Feet Level: The south drive has been advanced 6 feet, total 64 feet. The country has been very tight.—Stopes: The stopes on the ore body over the north level show no change, and continue to furnish good ore. The west cross cut at the end of the north level has been advanced 5 feet, total 17 feet. There is still good ore showing along the bottom of the face. The contractors have sunk No. 2 shaft 4 feet, total 100 feet, leaving 5 feet to sink to complete their contract. The contractors have driven No. 5 tunnel 50 feet, total 425 feet. No change to report.—Ore Raised: 253 bags, weighing 15 tons 2 cwt. 0 qr. 2 lbs., and containing 8630 ounces of silver, or an average of 560 ounces per ton, and 65 bags, weighing 4 tons 1 cwt. 1 qr., and containing 2503 ounces of silver, or an average of 616 ounces per ton, have been raised, bagged, and sampled.

—For week ending March 29: Engine Shaft, 100 Feet Level: The western cross cut has been advanced 3 feet, total 55 feet. No change to report. The 50 feet level south drive has been driven 11 feet, total 75 feet. This drive is now in the ironstone lying alongside the main body of pyrites. The stopes on the ore body north of the shaft are unchanged, rich ore showing in the various faces. Work in the west cross cut at the end of the north level has been continued as usual, and some good ore broken. In the face the rich ore has been split into two veins by an intrusion of baryta. No. 2 shaft has been sunk 3 feet 6 inches, total 103 feet 6 inches. No change to report. The contractors have driven No. 8 tunnel 30 feet, total 458 feet. The face is still in soft ground.—Ore Raised: 128 bags of ore, weighing 8 tons, and containing 11,040 ounces of silver, or an average of 1380 ounces per ton have been raised, bagged, and sampled.

**MOUNT ZEEHAN (Tas.).**—Manager reports for week ended March 27: Argent section: Main engine shaft No. 6 lode 72 feet level north. Have raised 8 tons 9 cwt. very fair seconds from south west branch. 72 feet level south intermediate drive extended 13 feet. Ore raised 7 tons 16 cwt. good seconds. Lode is 2 feet wide, of strong character, and carries good ore. The main drive has been extended 20 feet, total from crosscut 65 feet. We are nearly under the ore shoot in the intermediate drive, and therefore

expect to meet with payable ore during the incoming week. 132 feet level north, ore raised 123 tons 10 cwt. low quality seconds, due to admixture of mullock. At the 132 feet level south the rise has been put up 2 feet 6 inches, total 14 feet 6 inches. Ore raised 4 tons 11 cwt. fair seconds. Lode is 2 feet wide and improving.—Frances Lode: Prospect shaft has been sunk 7 feet, total 31 feet. Lode 5 feet wide, 2 feet carrying very good ore. Ore raised 20 tons good seconds. The plant here is working well. Concentrator has been run 57 hours and milled 168 tons seconds for 18 tons 14 cwt. concentrator, containing about 13 tons 19 cwt. lead and 1264 ounces silver.

**MYSORE.**—R. Hancock: Mining operations for the fortnight ending April 16: The sinking of Rowse's shaft has been suspended for a time owing to our having started cross cutting west. The 1460 cross cut west from shaft has been commenced with a view of intersecting the shoot met with at the 1260, and has been driven to date 16 feet. The 1360 feet level north, south of cross cut, has been driven 2 feet, making a total distance driven of 103 feet 4 inches; the lode is 1 foot wide, assaying 3 ounces 18 dwts. 19 grains. The rise in the back of this level has been put up 11 feet 6 inches, making a total height of 87 feet 6 inches; the lode is 1 foot 6 inches wide, assaying 7 dwts. 19 grains. The 1360 feet level north of winze has been driven 27 feet 6 inches, making a total distance driven of 67 feet 6 inches; the lode is 4 feet wide, assaying 6 dwts. 12 grains. The winze in the bottom of this level has been sunk 13 feet, making a total depth of 35 feet; the lode is 4 feet wide, assaying 18 dwts. 6 grains. The 1360 feet level south of winze has been suspended, the lode having become pinched. There are three stopes in the 1260 feet level north, the average width of the lode being 6 feet, giving an average assay of 1 ounce 0 dwts. 6 grains. We have started to rise in the back of No. 3 stope in the back of this level, 720 feet north of the shaft. The rise has been put up 14 feet; the lode is 5 feet wide, assaying 7 dwts. 19 grains. The rise in the back of the 1260 feet level south has been communicated with the 1160 feet level south. There are three stopes in the back of this level, the average width of the lode being 2 feet 6 inches, giving an average assay of 2 ounces 9 dwts. 13 grains. There are four stopes in the back of the 1160 feet level north, the average width of the lode being 1 foot 6 inches, giving an average assay of 19 dwts. 9 grains. The 1160 feet level south end has been driven 7 feet, making a total distance driven of 147 feet 6 inches, and holed to the 1260 rise south, has been put up 13 feet. The lode is 1 foot wide, assaying 2 ounces 10 dwts. There are three stopes in the back of the 1060 feet level north, the average width of the lode being 1 foot 2 inches, giving an average assay of 1 ounce 4 dwts. 14 grains. We have two pairs of men stripping down side in the bottom of this level in which the lode is 1 foot 6 inches wide, assaying 1 ounce 13 dwts. 6 grains. We have a pair of men engaged stripping down side in the back of the 990 feet level north, in which the lode is 1 foot wide, assaying 5 dwts. 5 grains. The lode in the stope in the back of the 890 feet level north is 2 feet 6 inches wide, assaying 3 dwts. 22 grains. We have a pair of men engaged stripping down side in the back of this level, in which the lode is 1 foot wide, assaying 3 dwts. 22 grains. We have resumed the driving of the 780 feet level north for the purpose of further developing the 620 chute. The end has been driven 7 feet, making a total distance driven of 434 feet. The lode in the stope in the back of this level is 3 feet wide, assaying 11 dwts. 17 grains. 620 feet level north of cross cut end has been driven 2 feet 10 inches, making a total distance driven of 226 feet 4 inches; the lode at present is very small. The winze in the bottom of this level has been sunk 5 feet 6 inches, making a total depth of 41 feet. Owing to the difficulties we have had to contend with through water in the sinking of this winze we have suspended it for a time, and put the machine to drive on the branch met with in the eastern side of the 236. There are two stopes in the back of this level, the average width of the lode being 2 feet, giving an average assay of 1 ounce 19 dwts. 19 grains. The rise in the back of the 620 feet level south of cross cut has been put up 8 feet 4 inches, making a total height of 125 feet 4 inches; the lode is 2 feet wide, assaying 2 dwts. 14 grains. The lode in the stope in the back of the 620 feet level south is 2 feet wide, assaying 3 dwts. 22 grains. 466 feet level north No. 1 cross cut has been driven 7 feet, making a total distance driven of 71 feet 3 inches. The rise in the back of the 400 feet level north of cross cut has been put up 6 feet 6 inches, making a total height of 109 feet. This has been suspended for a time, and the machine put to drive the 466 cross cut. 236 feet level north driving north on the quartz met with in the eastern side has been driven 7 feet, making a total distance driven of 11 feet; the lode is 2 feet wide, assaying 2 ounces 18 dwts. 6 grains. We have started to stope in the back on a lode 1 foot 6 inches wide. No assay made. The rise in the back of this level to meet the incline shaft has been put up 32 feet, making a total height of 89 feet. The lode is 1 foot wide, assaying 11 dwts. 17 grains. Incline shaft has been sunk and timbered to a depth of 53 feet.—Taylor's Shaft: There are two stopes in the 400 feet level north, the average width of the lode being 3 feet, giving an average assay of 9 dwts. 2 grains. Gilbert's shaft 650 feet level north end has been driven 20 feet 6 inches, making a total distance driven of 277 feet 6 inches. The lode is 7 inches wide, mixed. There are two stopes in the 520 feet level north, the average width of the lode being 2 feet 2 inches, giving an average assay of 7 dwts. 19 grains. The lode in the stope in the back of the 520 feet level south is 1 foot wide, assaying 10 dwts. 10 grains. There are two stopes in the 360 feet level north, the average width of the lode being 1 foot 6 inches, giving an average assay of 1 ounce 8 dwts. 7 grains. There are four stopes in the 290 feet level north, the average width of the lode being 2 feet 1 inch, giving an average assay of 15 dwts. 19 grains. There are two stopes in the back of the 290 feet level south, the average width of the lode being 3 feet, giving an average assay of 8 dwts. 11 grains. Taking away arches of ground in the back of the 180 feet level south. Lode 2 feet wide, assaying 1 ounce 2 dwts. 20 grains. Tennant's shaft has been sunk 6 feet 8 inches, making a total depth of 68 feet 9 inches below the 520 feet level. There is nothing here to report. The sinking of the shaft was suspended for four days while the pitwork was being repaired, and the machine was put to stope for the time in the back of the 520 feet level north. The rise in the back of the 520 feet level north has been put up 8 feet, making a total height of 37 feet. The lode is 7 feet wide (3 feet quartz) assaying 7 dwts. 3 grains. There are two stopes in the back of this level, the average width of the lode being 5 feet, giving an average assay of 1 ounce 11 dwts. 7 grains. The winze in the bottom of the 360 feet level north, south of cross cut, has been sunk 3 feet, making a total depth of 18 feet. The lode is 1 foot wide, assaying 6 dwts. 12 grains. The 290 feet level south, south of cross cut, has been driven 4 feet, making a total distance driven of 65 feet 6 inches. The lode is 8 inches wide, mixed. The lode in the stope in the back of the 290 feet level south, north of cross cut, is 1 foot wide. No assay made. Schaw's shaft, 450 feet level north, cross cut east, has been driven 1 foot 6 inches, making a total distance driven of 16 feet. The No. 3 rise in the back of this level has been put up 15 feet 3 inches, making a total height of 106 feet. The lode is 6 inches wide, assaying 6 dwts. 12 grains. The winze in the bottom of this level has been sunk 3 feet 3 inches, making a total depth of 63 feet 9 inches. The lode is 1 foot wide, assaying 18 dwts. 6 grains. The lode in stope in back of this level is 1 foot 3 inches wide, assaying 1 ounce 19 dwts. 4 grains. There are two stopes in the 450 feet level north, south of cross cut, the average width of the lode being 2 feet, giving an average assay of 15 dwts. The winze in the bottom of the 320 feet level north has been sunk 2 feet, making a total depth of 147 feet 6 inches. The lode is 1 foot wide, mixed, assaying 3 dwts. 22 grains. The rise in the back of the 320 feet level north of crosscut has been put up 6 feet, making a total height of 50 feet, the lode is 2 feet 6 inches wide, assaying 5 dwts. 21 grains. The lode in the stope in the back of this level is 1 foot wide, assaying 13 dwts. 1 grain. The 320 feet level south of crosscut has been driven 2 feet 6 inches, making a total distance driven of 156 feet 6 inches. There is nothing here to report. The lode in the stope in the back of this level is 1 foot 6 inches wide, assaying 1 ounce. The 220 feet level end north has been driven 3 feet 6 inches, making a total distance driven of 246 feet.—McTaggart's shaft: 330 feet level north end



has been driven 15 feet 3 inches, making a total distance driven of 171 feet. The lode is 1 foot 3 inches wide, assaying 6 dwts. 12 grains.—Glen shaft: 253 feet level north end has been driven 14 feet, making a total distance driven of 1229 feet 9 inches. There is nothing here to report. The crosscut east in this level has been driven 2 feet 3 inches, making a total distance driven of 236 feet 3 inches. Ribblesdale's shaft has been sunk 15 feet, making a total depth of 253 feet. 1060 crosscut west end has been driven 23 feet, making a total distance driven of 411 feet.—William's shaft: The crosscut east from the shaft at the 173 feet level has been driven 2 feet, making a total distance driven of 28 feet.—East prospect shaft: Crosscut east at the end of the south end of No. 2 crosscut has been suspended and the men put to drive south 6 feet from the south end of No. 2 crosscut in the crosscut east on the old workings met with at that point. The end has been driven 30 feet. The health of the camp is good.

NEW VIRGINIA TRANSVAAL.—The manager reports under date April 7: Datchman's shaft and levels: We are busily engaged repairing and putting in new timbers by one white man and several Kaffirs. The work is progressing very favourably and will soon become quite safe. Curtis shaft is being put in order to admit of sinking operations to be gone on with as soon as I have the boiler and Tangye steam pump fixed. These are on their way here, but owing to bad roads transport is slow. No. 1 adit tramway is being relaid with new sleepers where necessary, and the line to the mill is being ballasted and risen where required. It will soon be in working order. New trial shaft 68 feet deep on No. 2 reef (5 feet wide) running east to west. I am driving in both directions on the course of the reef producing rich ore, being full of visible gold. I have examined samples from various buckets to-day as they were drawn up. They seem even better than samples sent you on March 2. I shall soon have a good dump of the ore under hand ready to mill. I shall shortly effect a communication to this shaft with the Van Brandis section by a crosscut from Curtis shaft so that the ore may be trammed out through No. 1 adit.—No. 2 reef: I am putting down sundry trial pits on the line on this reef to prove the length of payable ground. The indications are very good. It appears to continue a long distance east. Whilst going west we have struck it running into the Gold Enough ground.—Gold Enough claims: Adit level, at present driven 60 feet, is just gaining considerable depth, and will admit of good stops or back as the adit advances. The reef is from 2 to 3 feet wide at present. It was much wider, but was not so good in quality as it is now. The ground is very similar to the Von Brandis, consequently it is most favourable for speedy driving or stopping. I intend laying down a branch tramway leading on the main tramway and so get the ore from the Gold Enough to the mill without any additional slipping or filling of wagons. As to milling, I will do my best to see the mine well ahead of the mill, but there will be no need of having to stop for ore. The several dumps and hurries are being added to considerably each day, and we have scarcely begun in real earnest. There are lots of good points waiting the arrival of Kaffir labour.

NEW QUEEN.—The following fortnightly report has been received from the mine, dated Charters Towers, March 16: No. 2 level north: The winze from this level has been sunk a further depth of 23 feet, making 71 feet from level. A thin vein of stone 3 inches thick has come in on the hanging wall during the last 10 feet sunk.—No. 1a level: Two men are stopping at the end of this level; the reef is small, about 4 inches, but of good quality.—No. 4 south level: Stopping has been carried on over this level, the formation varying from 3 to 10 feet, and carrying a reef very irregular in size from 3 to 10 inches. A large amount of mallock has to be removed from this stop.—No. 5 south level: This level has been extended a further distance of 15 feet, making a total distance of 198 feet from underlie. The ground in face of level has improved during the past week with about 6 inches of reef in the end. Stopping has also been carried on; the reef is irregular, varying from 4 to 9 inches. The ground is hard but shoots fairly well. No. 5 north level has been extended a further distance of 10 feet, making 125 feet from underlie shaft. The ground continues very hard with a thin vein of stone about 3 inches thick; this level, so far, has been very disappointing. We seem to be amongst a succession of slides which appear to be coming from the hanging wall. I am of opinion that until we get into more settled country we can scarcely expect to find any permanent reef. A little stopping is carried on over the level; the reef is very bumpy but of good quality.—Underlie shaft: We resumed sinking on Monday the 12th by hand labour. Four men are employed in two shifts taking out the sink when they are assisted by the rock drillers occasion suits in making the roadway sufficiently large enough. There is about 6 inches of stone in the sink, which appears to be of good quality.—Formation: The northern level has been extended a further distance of 15 feet, making total distance from end of crosscut 182 feet, with 5 feet of formation in the end of level. No reef at present. Stopping has also been carried on over this level. The reef is bumpy, varying from a leader to 1 foot. Quantity of stuff raised during the fortnight: No. 4 south level 117 trucks, No. 5 north and south level 245 trucks, No. 4 formation 60 trucks, total 422 trucks=305 tons.—(Signed) W. Henderson.

QUEEN'S BIRTHDAY UNITED.—The directors have received the following mail advice from Mr. W. T. Hansford, the company's local secretary at Dunolly, dated April 3: Queen's Birthday Mine: Main Shaft: During the past fortnight works have been steadily pushed ahead at the main shaft with great vigour. Water has been lowered to 700 feet level, and in about another fortnight we hope to have the shaft dry: this done, our work will be concentrated on development. Mr. Kent, mining manager, will survey the 700 feet level, and ascertain if the grand old reef has, as we believe, made east. If golden stone is struck here, success is assured.—No. 5 Level: The 600 feet level has been extended 17 feet north; we are in the stone, and if in the next fortnight it is not found payable we shall also cross out to the east main wall, with the expectation of striking the reef good there.—Centre Shaft: At the centre shaft we have been much bothered with foul air during the past fortnight. The local committee have ordered air pipes, and when these are fixed with our fan we shall soon clear the mine skids to poppet legs and other necessary work done, and directly the mine is clear three shifts of men will go below.—Belgium and Perseverance Mine: At the Belgium level extended 25 feet, total distance from shaft 116 feet, we believe we are within 10 or 15 feet of the lode. We have passed through sundry heavy leaders; the men went down to-day to see if the water was still in the winze, and found in it 12 feet, a proof to us that we have not yet tapped the course of the lode; when we do strike it we shall do our best to master the water, and will run levels on the course of the lode.

QUEEN CROSS REEF.—Copy of manager's report for fortnight ending 20th March: Since last report Davis and party, contractors for sinking the straight shaft, have sunk 13 feet, making total depth from the surface 757 feet. They are below the timber 82 feet. The ground has been hard for sinking this fortnight. We have cleaned up a crushing of 56 tons at the Fair Rosemond mill for a yield of 69 ounces 14 dwts. of melted gold. Tributaries have cleaned up a crushing of 48 tons at the Defiance mill for a yield of 53 ounces 1 dwt. 15 grains of melted gold. The other tributaries are all doing fairly well. Rinking of vertical shaft will be carried on by three shifts of men in future, so that the shaft will no doubt be sunk at greater speed. Credit balance in hand £645 18s. 7d.

SOUTH-EAST MYSORE.—Fortnightly report of Captain M. Scantlebury, mine agent, dated April 18: Beresford's shaft has been sunk 6 feet, which now makes a depth of 93 feet 3 inches on the course of the lode, and 191 feet from surface. The lode is fully 6 feet wide from wall to wall, but during the past week there has been a patch of country rock in the lode, which, for the moment, has rather impoverished it. The assays are only 1 dwt. 23 grains, and 6 dwts. 15 grains of gold to the ton. This is only temporary. Pigott's shaft has been sunk 8 feet, which now makes a depth of 172 feet from surface. We have passed through several branches of quartz showing a little gold in the pan, and are, from the appearance of the rock, getting near the lode.—Surface: We are pushing the erection of air compressor. The boiler is in position, and in two weeks more we expect to start it.

## EXPORT AND IMPORT TRADE.

### THE BOARD OF TRADE RETURNS—APRIL TABULAR STATEMENT.

Specially compiled for "The Mining Journal" from the Board of Trade Returns.

THE Board of Trade Returns show that the Imports for April amounted to £35,008,029 against £32,120,160 in the corresponding month of last year, showing an increase of £2,887,869. The Exports for last month were £17,569,876 compared with £16,617,977, being an increase of £951,899. The Imports for the four months ended April amounted to £142,710,884, against £129,036,655 in the same period last year being an increase of £13,674,229. The Exports for the four months were £71,490,108, against £71,170,209, being an increase of £319,899.

#### EXPORTS:—SUMMARY OF INCREASES AND DECREASES.

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	INCREASE.	DECREASE.	INCREASE.	DECREASE.
<b>Raw Materials:</b>				
Coal and Fuel .. Tons	621,602	—	4500,006	£ —
Coal, &c., shipped for steamers' use .. Tons	175,092	—	—	—
<b>Metals:</b>				
Brass, and manufactures of .. Cwts.	1,048	—	2,176	—
COPPER, unwrought and wrought .. Cwts.	—	30,810	—	93,418
HARDWARE and cutlery .. £	—	—	—	9,740
IMPLEMENTS and tools, and parts thereof .. £	—	—	2,753	—
IRON, unwrought and wrought .. Tons	—	11,808	9,824	254,212
LEAD, pig, rolled, &c. .. Tons	1,245	—	—	4,579
PLATE, and plated gilt wares &c. .. £	—	—	143,264	—
TELEGRAPH WIRES, &c. .. £	—	—	16,082	—
TIN, unwrought .. Cwts.	6,336	—	—	8,738
ZINC or SPALTER .. Tons	—	9,916	—	219
OTHER ARTICLES .. £	—	—	174,099	377,966
<b>Total ..</b>	<b>—</b>	<b>—</b>	<b>196,807</b>	<b>—</b>
<b>Machinery:</b>				
Steam engines ..	—	—	38,987	—
Other descriptions ..	—	—	93,998	—
<b>Total ..</b>	<b>—</b>	<b>—</b>	<b>132,985</b>	<b>—</b>
<b>ALKALI .. Cwts.</b>	<b>—</b>	<b>181,189</b>	<b>—</b>	<b>71,298</b>
<b>CEMENT .. Tons</b>	<b>—</b>	<b>630</b>	<b>—</b>	<b>3,769</b>
<b>PRODUCTS OF COAL .. £</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>16,737</b>

#### EXPORTS:—BRITISH AND IRISH PRODUCE.

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	Month ending April 30.	Month ending April 30.	Month ending April 30.	Month ending April 30.
<b>Metals and Articles Manufactured therefrom (except Machinery):—</b>				
Brass, and Manufactures of, not being Ordnance ..	8,913	9,959	35,213	37,380
COPPER: Unwrought, in Ingots, Cakes, or Slabs, and Precipitate ..	12,939	9,858	31,890	21,923
To Germany ..	20,803	8,189	49,959	17,022
" Holland ..	5,132	2,821	12,534	4,999
" France ..	14,496	5,441	36,727	18,964
" Italy ..	1,705	2,082	4,288	4,712
" British East Indies ..	907	62	2,186	139
" Other countries ..	1,613	4,233	4,373	9,622
<b>Total ..</b>	<b>57,595</b>	<b>35,667</b>	<b>140,957</b>	<b>78,791</b>
Wrought, or Manufactures, unenumerated ..	1,010	854	3,029	2,570
To Sweden and Norway ..	1,163	186	3,415	642
" Germany ..	4,349	4,013	12,943	11,156
" Denmark ..	1,949	2,895	5,668	7,631
" Egypt ..	875	2,173	2,705	6,114
" Brazil ..	12,265	5,375	33,453	13,029
" British East Indies ..	799	1,001	2,707	2,810
" Australasia ..	6,515	6,081	19,799	17,474
" Other countries ..	—	—	—	—
<b>Total ..</b>	<b>28,925</b>	<b>22,528</b>	<b>83,719</b>	<b>61,506</b>
Mixed or Yellow Metal ..	5,639	567	13,320	1,320
To China and Hong Kong ..	12,966	14,229	30,056	29,933
" British East Indies ..	6,338	7,662	16,133	10,197
" Other countries ..	—	—	—	—
<b>Total ..</b>	<b>24,943</b>	<b>22,458</b>	<b>59,509</b>	<b>50,470</b>
<b>Total of Copper ..</b>	<b>111,463</b>	<b>80,563</b>	<b>284,185</b>	<b>190,767</b>

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	Month ending April 30.	Month ending April 30.	Month ending April 30.	Month ending April 30.
<b>Imports and Tools, and parts thereof ..</b>	<b>—</b>	<b>—</b>	<b>94,875</b>	<b>97,628</b>
<b>Iron and Steel: Pig-iron:</b>				
To Russia ..	582	8,093	20,825	20,825
" Sweden and Norway ..	2,701	5,078	12,744	12,744
" Denmark ..	1,871	2,151	3,438	4,247
" Germany ..	31,201	28,707	61,972	58,274
" Holland ..	9,586	10,319	22,785	22,785
" Belgium ..	4,918	3,031	14,509	8,951
" France ..	5,411	2,515	11,386	8,957
" Portugal, Azores, and Madeira ..	4,780	1,377	8,099	2,439
" Spain and Canaries ..	1,471	740	4,453	2,439
" United States ..	4,322	1,093	22,000	5,345
" Australasia ..	2,789	1,315	7,024	3,036
" British North America ..	1,051	912	2,405	2,133
" Other countries ..	4,421	8,940	11,980	20,518
<b>Total ..</b>	<b>81,783</b>	<b>81,354</b>	<b>191,907</b>	<b>184,185</b>
Bar, angle, bolt, and rod ..	10,870	11,110	69,886	70,872
Railroad of all sorts ..	44,570	42,536	205,590	191,360
Iron and steel wire, &c. ..	3,356	2,742	54,528	50,809
Galvanized sheets ..	13,676	13,256	167,208	155,584
Hoops, plates, boiler plates, &c. ..	10,687	11,607	82,669	90,344
Cast and wrought iron, &c. ..	24,324	25,540	331,874	312,439
Old, for re-manufacture ..	8,961	9,896	26,974	25,441
Steel, unwrought ..	12,510	16,062	137,474	155,642
Manufactures of steel, or of iron and steel combined ..	1,844	654	47,366	26,489
<b>Total of Iron and steel ..</b>	<b>252,159</b>	<b>240,351</b>	<b>1,821,265</b>	<b>1,567,053</b>

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	Month ending April 30.	Month ending April 30.	Month ending April 30.	Month ending April 30.
<b>Tin Plates and Sheets:</b>				
To Russia ..	1,870	1,808	23,419	22,775
" Germany ..	294	270	3,887	3,560
" Holland ..	344	459	5,143	6,163
" France ..	952	1,152	12,737	13,999
" Portugal, Azores, and Madeira ..	150	123	1,968	2,327
" Italy ..	280	129	3,724	1,905
" Roumania ..	399	970	5,675	13,574
" United States ..	31,651	13,910	414,515	161,576
" Brazil ..	403	388	5,507	4,480
" Argentine Republic ..	137	204	2,405	3,258
" British East Indies ..	796	829	7,578	7,094
" Australasia ..	380	1,169	5,160	14,284
" British North America ..	599	1,545	7,964	14,181
" Other countries ..	1,198	2,501	17,361	31,772
<b>Total ..</b>	<b>39,093</b>	<b>34,694</b>	<b>616,834</b>	<b>504,888</b>

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	Month ending April 30.	Month ending April 30.	Month ending April 30.	Month ending April 30.
<b>Lead: Pig Sheet, Piping, and Manufactures:</b>				
To Russia ..	82	1,765	£ 570	£ 16,361
" Germany ..	8-6	163	2,189	1,868
" China and Hong Kong ..	215	31	2,139	120
" Japan ..	252	118	2,947	1,580
" United States ..	8	2	73	23
" British East Indies ..	673	723	10,605	11,114
" Australasia ..	41	45	468	462
" British North America ..	42	100	524	1,070
" Other countries ..	1,204	1,446	12,823	12,035
<b>Total ..</b>	<b>2,913</b>	<b>4,158</b>	<b>35,528</b>	<b>43,547</b>

#### BRITISH AND IRISH PRODUCE—Continued.

PRINCIPAL AND OTHER ARTICLES.	QUANTITIES.		VALUES.	
	Month ending Apr. 30.	Month ending Apr. 30.	Month ending Apr. 30.	Month ending Apr. 30.
<b>Plate &amp; Plated &amp; Gilt Wares:</b>				
Telegraphic Wires, & apparatus connected therewith ..	—	—	26,179	21,400
<b>Tin, Unwrought:</b>				
To Russia ..	311	3,495	1,507	13,105
" Sweden and Norway ..	537	1,197	2,590	4,417
" Germany ..	572	898	7,728	2,531
" France ..	885	1,222	4,345	4,929
" Turkey ..	587	1,222	2,773	4,577
" United States ..	838	610	4,053	2,302
" British North America ..	659	708	3,125	2,798
" Other countries ..	2,866	3,545	12,540	13,184
<b>Total ..</b>	<b>6,956</b>	<b>13,361</b>	<b>33,659</b>	<b>49,741</b>
<b>Zinc or Spelter: Unwrought and Wrought ..</b>	<b>20,567</b>	<b>10,651</b>	<b>17,198</b>	<b>8,460</b>
<b>Total of Principal Articles ..</b>	<b>—</b>	<b>—</b>	<b>2,554,429</b>	<b>2,337,841</b>
<b>Total of Metals and Articles Manufactured therefrom (except Machinery) ..</b>	<b>—</b>	<b>—</b>	<b>68,443</b>	<b>69,327</b>
<b>Alkali ..</b>	<b>647,179</b>	<b>465,990</b>	<b>2,622,873</b>	<b>2,426,068</b>
<b>Cement ..</b>	<b>39,461</b>	<b>38,351</b>	<b>202,445</b>	<b>132,147</b>
<b>Products of coal (including paraffin, petroleum, &amp;c.) ..</b>	<b>—</b>	<b>—</b>	<b>67,093</b>	<b>63,327</b>
<b>Total ..</b>	<b>—</b>	<b>—</b>	<b>134,290</b>	<b>117,563</b>

#### MINING MACHINERY.

To Countries in Europe ..	QUANTITIES.		VALUES.	
	1893.	1894.	1893.	1894.
United States ..	—	—	361	2,477
Countries in South America ..	—	—	660	2,741
British Possessions in S. Africa ..	—	—	20,927	12,148
" East Indies ..	—	—	3,928	3,339
" Australasia ..	—	—	130	618
" Other Countries ..	—	—	2,943	1,470
<b>Total ..</b>	<b>—</b>	<b>—</b>	<b>27,949</b>	<b>23,655</b>
<b>Machinery (Total) ..</b>	<b>—</b>	<b>—</b>	<b>815,922</b>	<b>910,320</b>
<b>Steam Engines ..</b>	<b>—</b>	<b>—</b>	<b>199,537</b>	<b>228,514</b>

#### EXPORTS OF FOREIGN AND COLONIAL MERCHANDISE.

PRINCIPAL ARTICLES.	QUANTITIES.		VALUES.	
	Month ended Apr. 30.		Month ended Apr. 30.	
	1893	1894	1893	1894
	Tons.	Tons.	£	£
Copper:	950	355	46,989	14,881
Unwrought and part wrought				
Iron and Steel:				
Bar, angle, bolt, and rod ..	1,814	1,115	14,511	8,103
Steel, unwrought ..	114	171	1,445	1,359
Manufactures:				
Girders, beams, and pillars ..	135	117	1,088	1,040
Unenumerated ..	66,988	42,139	46,854	32,484
	Cwts.	Cwts.		
Petroleum ..	98,157	564,875	5,113	7,798
	Gals.	Gals.		
Quicksilver ..	161,280	302,119	22,216	22,401
	Lbs.	Lbs.		
Saltpetre ..	7,920	2,862	5,313	2,542
	Cwts.	Cwts.		
Tin, in blocks, ingots, bars, or slabs ..	47,188	37,773	221,669	131,442



# MINING IN CORNWALL

AND DEVON:  
NOTES ON WESTERN MINING, EDITORIAL  
AND OTHERWISE.

THE Share Market has relapsed once more into comparative inactivity, and the amount of business transacted has been very trifling. This state of things is almost sure to continue until a decided upward movement in tin takes place, for whatever improvements there may be in the mines, cannot make their influence felt in the face of the present unremunerative price of mineral. There are exceptions to every rule, and just now Wheal Grenville seems to have escaped, to a certain extent, from the depressing influence which has made itself felt in nearly every other mining property. The shares have had a substantial rise during the last few weeks, and are extremely difficult to maintain, even at the enhanced price. Mr. Gould, the able Chairman of the company, has often been twitted for his optimism, but his predictions have to a large extent been realised, and Wheal Grenville is undoubtedly turning out one of the finest properties in the county. In Fortescue's shaft, which is going down into whole ground, they have a wonderful lode, which has been officially valued at £100 per fathom. We believe we are justified in saying that even at the present price of tin it is worth more than this. Tin was cut a few fathoms higher up, but at that time the lode did not appear to be going on the same underlie as the shaft. Now, however, the lode has again come into the shaft, and is going down with the same underlie, so that the shaft is being sunk directly on the course of the lode. This will naturally be a great advantage, and will mean increased returns immediately. Shareholders in Grenville experienced a depreciation in their stock a little time since, but those who have maintained their holding are likely to be well rewarded.

THE run at Dolcoath is still absorbing a good deal of attention, and the absence of any official information has been the subject of much comment. At the time of writing the engine had not gone to work, and some uncertainty prevailed as to when it would start. Affairs are assuming a more serious aspect in consequence of the delay, and it is beyond question that the returns must seriously suffer in consequence. The pumps, pit-work, &c., are being thoroughly overhauled, and the fact of the engine being idle gives exceptional facilities for attending to this. When once the rods in the shaft are clear, they will be able to work the engine at its highest speed with more confidence. A suggestion has been made that a new perpendicular shaft south should be put down from surface to below the present workings, and this will in all probability have to be done sooner or later. Its cost will naturally be enormous, but the work will of necessity be slow, so that the outlay will be spread over a considerable period. This is a matter which the adventurers ought to discuss immediately, and seeing the ultimate advantage shared in by the lord, he might reasonably be expected to bear a portion of the cost. Mr. Basset has an opportunity of improving upon the past record of the Tiddy estate in its relations with Dolcoath, of which, it is to be hoped, he will avail himself. Permanent improvements of this kind have recently been made at West Frances and Wheal Grenville, and in each case the lord has dealt generously with the adventurers.

BOTALACK adventurers met on Wednesday, and, as we intimated some weeks ago would probably be the case, the state of affairs showed a marked improvement. The actual loss on the 16 weeks is only £148, and the returns of tin show a very marked increase. The Wheal Cook part of the sett is turning out a large amount of mineral, and there is a gratifying rise in the average produce of the stuff, which for some time was very low. The mine is being vigorously worked, and surface machinery compares very favourably with that of most mines in the county.

DUTY ON MINING MACHINERY.—Whilst British Columbia members are legislating over tariff matters, says the *Miner*, Nelson, British Columbia, the following return may not be out of place:—“During the fiscal year ending June 30, 1893, the value of the mining machinery imported duty free into Canada under the provisions of the law admitting mining machinery of a class or kind not manufactured in Canada, amounted to \$87,208, of which \$72,478 came from the United States, and \$14,730 from Great Britain. The distribution by provinces shows the importations as follows:—

Ontario	\$27,899
Quebec	18,519
Nova Scotia	22,019
New Brunswick	30
Manitoba	9,166
British Columbia	9,585
<b>Total</b>	<b>\$87,208</b>

This return gives a complete denial to the misleading clause which last year admitted free of duty “mining machinery of a kind not manufactured in Canada.” The working of this clause in the past has shown, that it does not admit mining machinery free of duty, except in the case of diamond drills and one or two such cases. It, however, does admit of the importation of mining machinery free of duty, provided the importer has a sufficiently strong pull with the department. It opens up the door for favouritism, and serves no purpose but securing for the Government the whip hand.

A NEW USE FOR ALUMINIUM.—The only stone that can be used satisfactorily for lithography is found at Schlenhofen, Bavaria, and it becomes dearer every year. A stone 30 inches by 40 inches, and weighing 500 lbs., costs £20. A process has been patented, and a plate weighing from 2 to 10 lbs., and not costing over £2, will do the work of a £20 stone. A special advantage is that the aluminium plate can be bent to fit a cylinder press. The aluminium plate is bound to replace not only lithographing stone, but the steel plate.” No says Mr. Johnson R. Bigelow, of Cincinnati.

## EUROPEAN EDITION.

Annual Subscription (post free) 12s. 6d. (U.K.), abroad 14s. Single Copies 1s. (post free) 1s. 3d.

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## COMPANIES AND LEGAL ANNOUNCEMENTS.

\*. Advertisements are inserted in this column at the rate of 9d. per line with a minimum charge of 7s. 6d.

### MASON AND BARRY (LIMITED). (SAN DOMINGOS MINE, PORTUGAL.) DIVIDEND.

NOTICE IS HEREBY GIVEN, that a DIVIDEND for the year ending 31st December, 1893, at the rate of 2s. per share, free of Income Tax, was declared at the Ordinary General Meeting held this day, the same being payable on and after Thursday, the 17th inst., at the Offices of the Company, 87, Cannon Street, London, E.C.

The holders of “Share Warrants to Bearer” must leave Coupons (Series No. 2) for examination four days previous to payment, between the hours of 11 and 2, on any day except Saturday. Coupons may be presented after to-day, and must be listed on the Company's printed form obtainable at the Company's Office.

By order

JOHN G. BARRY, F.C.A. Secretary.

Offices of the Company,  
87, Cannon Street, London, E.C., 7th May, 1894.

### RIO TINTO COMPANY (LIMITED).

DIVIDEND ON SHARES TO BEARER.

HOLDERS OF SHARE WARRANTS TO BEARER are informed that they will receive PAYMENT OF THE DIVIDEND declared at the General Meeting held on the 27th ult., at the rate of 7s. per Share, free of income-tax, on and after Wednesday, the 30th May, 1894, on presentation of Coupon No. 31, either at the Company's Office in London, or at the Société Générale, Rue de Provence, 51, Paris, or at the Deutsche National Bank in Bremen.

Coupons for payment in London must be left four clear days previously for examination, and may be deposited on or after the 15th inst.

By order

GEO. N. THOMSON, Secretary.

Offices of the Company, 30, St. Swithin's Lane,  
10th May, 1894.

## SHIPPING.

### UNION LINE.

FOR SOUTH AFRICAN GOLD FIELDS.—WEEKLY SERVICE.—CAPE OF GOOD HOPE, NATAL, and EAST AFRICAN ROYAL MAIL STEAMERS.—The UNION STEAMSHIP COMPANY'S ROYAL MAIL and INTER-MEDIATE STEAMERS will sail as follows for the SOUTH and EAST AFRICAN PORTS, to ZANZIBAR, calling at LISBON, MADEIRA, and TENERIFE.

Steamers.	Antwerp.	Rotterdam.	Hamburg.	Southampton.
14 Spartan	May 5	May 12	May 19	May 26
15 Scot (twin screw)	May 20	May 27	June 3	June 10
16 Goth (twin screw)	May 20	May 27	June 3	June 10
17 Mexican	May 20	May 27	June 3	June 10

1 Calling at Madeira. 2 Via Lisbon and Tenerife. 3 To East Africa. Free railway tickets from London and Plymouth to Southampton. Cheap Tickets are issued for Passengers' Friends. All Steamers now leave Southampton on Saturday. The Union Line Express is despatched from Waterloo Station (Main Line Platform) every Saturday.

### RETURN TICKETS ISSUED.

Apply to the UNION STEAMSHIP COMPANY (Limited), Canute Road, Southampton; 14, Cockspur Street, London, S.W.; and South African House, 94 to 96, Bishopsgate Street Within, London, E.C.

### CASTLE LINE.—CAPE & NATAL MAILS.

WEEKLY SERVICE FOR THE GOLD FIELDS OF SOUTH AFRICA.—The CASTLE COMPANY'S STEAMERS leave LONDON (East India Dock Basin, Blackwall) every FRIDAY, and sail from SOUTHAMPTON every SATURDAY.

Steamers.	London.	Southampton.
Hawarden Castle (via Madeira) ...	May 13	May 19
*Dunne Castle (via Grand Canary and St. Helena) ...	May 25	May 26
*Dunbar Castle ...	May 31	June 2
*Norham Castle (via Madeira) ...	June 1	June 2

\* To Algeas Bay direct. 1 Takes Cargo also for Madagascar and Mauritius. 2 Takes Passengers for Madagascar and Mauritius.

Return tickets to all Ports.

Free Tickets by Rail from Waterloo to Southampton. Apply to DONALD CURRIE and Co., 3, Fenchurch Street, London, E.C.

## ENTERTAINMENTS.

### GAIETY THEATRE.

LESSEE and MANAGER, Mr. GEORGE EDWARDS.—BRILLIANT SUCCESS OF THE SECOND EDITION OF “DON JUAN,” a Three-act Burlesque. Messrs. Arthur Roberts, Robert Pateman, Willie Ward, Colin Coop, and Edmund Payne; Misses Millie Hylton, Louise Montague, Lillie Belmont, Topsy Sinden, Lettice Fairfax, and Katie Seymour. TO-NIGHT and EVERY EVENING at 8. Doors open at 7.45.

### OPERA COMIQUE.

THIS EVENING, at 8.30, “A SOCIETY BUTTERFLY,” Mrs. Langtry, Misses Rose Leclerc, E. Brinsley Sheridan, Walsingham, L. Morand, E. Norton, E. Williams, E. Vernon, G. Evisson, Messrs. W. Herbert, A. Beaumont, E. Rose, H. J. Carvill, S. Jerram, H. Tompkins, C. R. Stuart, and F. Kerr.

### PRINCE OF WALES THEATRE.

THIS, and EVERY EVENING, at 8.15, Mr. George Edwards's Company in the entirely new and original Musical Comedy, entitled, “A GAIETY GIRL.” Words by Owen Hall; lyrics by Harry Greenbank; music by Sidney Jones. Messrs. C. Hayden Coffin, Eric Lewis, Bradfield, Kaye, D'Orray, Porteous, Rimmer, Somerville, and Harry Monkhouse; Mesdames Decima Moore, Juliette Nesville, Grey, Cutler, Studholme, Phelps, M. Hobson, Massey, Pounds, and Lottie Venn. The New Carnival Dance by Misses Navette, Batchelor, Vanini, and Gorst. MATINEE EVERY SATURDAY 2.30. Box Office open from 10 till 6.

### ALHAMBRA THEATRE OF VARIETIES.

TO-NIGHT, Two Grand Ballets. At 8, “DON QUIXOTE,” a new, strong, and IMMENSELY SUCCESSFUL VARIETY PROGRAMME, including Mlle. MEALY and M. FUGERE, the popular Parisian artistes; MORRIS CRONIN, in an Original and indescribable performance; Letta and Foden; Maggie Daggan; BLOCKSON and BURNS, two of the Quaintest and Funniest of American Comedians; and CARL HERTZ, in a New and Startling Illusion, entitled AFTER THE FLOOD. At 9.30, THE NEW VICTORIA CROSS TABLEAU VIVANTS. Also, at 10.45, THE REVOLT OF THE DAUGHTERS. Prices, 6d. to £3 3s. Doors open at 7.30. Telephone 35,065.

## WANTED.

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AN ITALIAN HOUSE of highest standing, and well known in Italy and England, wishes to obtain the AGENCY of a first-class MANUFACTURER of SULPHATE of COPPER. Highest references at disposal. Address, “SULPHATE,” care of A. BARRET, Esq., Turin.

ASSISTANT AMALGAMATOR or ENGINEER in a BATTERY. ENGAGEMENT WANTED for South Africa or elsewhere. Experience in New Zealand. Understands Assaying. Address, “C. E. T.,” MINING JOURNAL, 18, Finch Lane, E.C.

COMPETENT METALLURGIST SEEKS EMPLOYMENT as Assistant Manager, Chemist or Assayer. Good references. Apply, “ZINGARI,” MINING JOURNAL Office, 18, Finch Lane, London.

ENGLISH CAPITALISTS wishing to invest in gold mining in Nova Scotia should write me for particulars and offers. Address, PERCY J. WHITE, M.E., Isaacs Harbour, Guysboro Co., Nova Scotia.

### INVESTMENT.

CAPITALISTS WANTED to take part in exploitation of rich COPPER MINING PROPERTIES in Scandinavia. Splendid prospects. Address, “SWEDEN,” MINING JOURNAL Office, 18, Finch Lane, London, E.C.

MINING ENGINEER, “M.I.M.M.” seeks SITUATION. Spanish spoken. Home and foreign experience. Apply, “A.T.,” MINING JOURNAL, 18, Finch Lane, E.C.

WANTED, COPPER ORE, MATTE, REGULUS, ALLOYS, or OLD METALS of any kind, also SILVER ORES, any quantity and regular supplies, PURCHASED for CASH. Send samples and full particulars. The correspondence of mine owners and others in any part of the world invited. WILLIAM ELMORE, 13, Bond Street, Leeds. Telegrams—“Copper,” Leeds.

REQUIRED for South America, an EXPERIENCED MINING ENGINEER. Knowledge of prospecting essential, and must speak Spanish. Reply by letter to “A. O.,” care of BATES, HENDY and Co., 37, Walbrook, E.C.

MINER REQUIRED IMMEDIATELY for Gold Mine on the West Coast of Africa. Must be experienced in Timbering. Apply by letter, stating age and salary required (all found), to “G. 924,” at SHELLEY'S Advertising Offices, 38, Gracechurch-street, London, E.C.

## SALES BY AUCTION.

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### TO INVESTORS, SPECULATORS, SHARE-HOLDERS, AND OTHERS.

THE STOCK AND SHARE AUCTION COMPANY, of 45, Finsbury Pavement, London, E.C., HOLD SALES BY AUCTION, at the Mart, Tokenhouse Yard, E.C., on the 1st and 3rd Wednesday in each month, when a large number of STOCKS and SHARES in sound dividend-paying undertakings are submitted in lots to suit all buyers.

These sales are the recognised medium for disposing of all miscellaneous, unquoted, and music-hall shares, and are largely attended by speculators and investors. Commissions executed for country clients unable to attend the Mart personally, no charge being made to purchasers.

Our terms for including lots in these sales are a prepaid fee of £1 1s., to cover all expenses for advertising, &c., and a commission of 5 per cent. on amount realised. No charge beyond the £1 1s. if a sale is not effected.

The next Sale takes place on Wednesday, May 16th, 1894, at 12 o'clock noon precisely, and will include shares in the following and other well-known Companies, viz.:—Aerated Bread Company, Golden Grain Bread Company, Kensington Press, Harrod's Stores, Veuve Monnier, H. Spicer and Sons, Manchester Ship Canal, Daval Restaurants for London, London Road Car Company, London Share and Debenture Company, Waterloo House and Swan and Egar, Southern Counties Dairy Company, London, Gloucestershire, and North Hants Dairy Company, Palace Theatre, Gaiety Theatre, London Pavilion, Alhambra, Oxford, New Tivoli, Empire, Olympia, Moore and Burgess, Debentures, &c.

Particulars of lots to be included in the next Sale should be forwarded immediately. Descriptive catalogues may be obtained of the Auctioneers, &c., 45, Finsbury Pavement, London, E.C.

### DISMANTLING.

#### KILTON MINES, Brocton-in-Cleveland.

WILLMAN and DOUGLAS, F.A.I., have received instructions TO SELL BY AUCTION, at the Mines, on WEDNESDAY May 9th, 1894, the WHOLE of the

#### FIXED and LOOSE PLANT, STORES, &c., comprising—

Winding Engine, semi-portable Engine, Cameron Pumps, four Lancashire Boilers, Heapsteads, Water and Ironstone Tubs, Pipes, the whole of the Permanent Way, &c.

#### SALE AT 11.15 PROMPT.—ON VIEW, TUESDAY, MAY 8.

Trains leave Middlesbro' for Brocton at .32 and 10.40. Brakes will meet these trains to carry purchasers to the Mines. Catalogues may be had from

THE AUCTIONEERS, 26, Albert Road, Middlesbro'.  
Nat. Tel. 5142.

### PERIODIC SALES OF TIN IN SLABS.

THE MANAGERS of the BILLITON TIN COMPANY beg to inform the Public that the next AUCTIONS of BILLITON TIN, will take place at Batavia (Isle of Java), on the following dates, viz.:—June 27th, August 29th, October 31st, December 19th, 1894; February 27th and April 24th, 1895; that on June 27th, 1894, will be presented about 13,000 picols tin; and that the quantity to be sold in the following auctions will be published afterwards. The quality of this tin will not be inferior to that of Banca.

A. VAN KAPPEN, Director.  
M. G. STAAL, Secretary.

The Hague, May 7th, 1894.

IT IS WORTH YOUR WHILE TO BUY YOUR LUBRICANTS direct, pure hydro-carbon, largest sale in the world. Engine Oil, 11½d.; Cylinder Oil, 11½d.; Machinery Oil, 11½d.; Bench Oil, 9½d.; Gas Engine Oil, 1s. 6d.; and Dynamo Oil, 1s. 6d. per gallon, in 40 gallon barrels; carriage paid. RELIANCE LUBRICATING OIL COMPANY, 19 and 20, Water Lane, Great Tower Street, London, E.C.

CALIFORNIAN AND EUROPEAN AGENCY,  
609, MONTGOMERY STREET, SAN FRANCISCO, CAL.  
JACKSON, Manager.



## PROVINCIAL SHARE MARKETS.

## THE CORNISH MINE SHARE MARKET.

**M**R. SAMUEL JOHN DAVEY, Dealer in Cornish Mine Shares, Redruth, Cornwall, reports under date of May 10 (4 o'clock) as follows:—We have had a quiet market this week. Dolcoath fell £5, but Wheal Grenville advanced £2. Market is inactive to-day. Following are quotations:—Blue Hills,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Carn Brea, 10 $\frac{1}{2}$  to 11 $\frac{1}{2}$ ; Cook's Kitchen,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Dolcoath, 71 to 73; East Pool, 11 to 11 $\frac{1}{2}$ ; Killfret, £3 4s. to £3 6s.; South Condurrow,  $\frac{1}{2}$  to 1; South Croft, 2 $\frac{1}{2}$  to 3; South Wheal Frances, 1 $\frac{1}{2}$  to 1 $\frac{3}{4}$ ; Tincroft, 12 $\frac{1}{2}$  to 13; West Frances, 2 $\frac{1}{2}$  to 3; West Kitty, 6 $\frac{1}{2}$  to 7; Wheal Agar, 2 $\frac{1}{2}$  to 3; Wheal Bassett, 3 to 3 $\frac{1}{2}$ ; Wheal Grenville, 19 to 21; Wheal Kitty (St. Agnes),  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Polberro, 1 to 1 $\frac{1}{2}$ .

Mr. MICHAEL WILLIAMS BAWDEN, Mining and Assaying Offices, Liskeard, Cornwall, writes (May 10) as follows:—The mining market presents a steady appearance, and prices much the same. With the firmness of tin, and further rise of 27s. 6d. per ton on Tuesday's sale, most shares ought to advance with the improved prospects. Blue Hills shares are in demand on a good lode at the 66 fathom level. Dolcoath receded £5 on the delay in clearing the old sump shaft, and getting the engine to work. The following are closing prices:—Blue Hills, 6s. to 7s. 6d.; Carn Brea, 10 $\frac{1}{2}$  to 11; Cook's Kitchen,  $\frac{1}{2}$  to 1; Dolcoath, 71 to 71 $\frac{1}{2}$ ; East Pool, 10 $\frac{1}{2}$  to 11; Killfret, 3 to 3 $\frac{1}{2}$ ; Levant, 6 to 6 $\frac{1}{2}$ ; Phoenix United,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; South Croft, 2 $\frac{1}{2}$  to 3; South Frances, 1 $\frac{1}{2}$  to 1 $\frac{3}{4}$ ; Tincroft, 12 $\frac{1}{2}$  to 13; West Frances, 2 $\frac{1}{2}$  to 3; West Kitty, 6 $\frac{1}{2}$  to 7; Wheal Grenville, 18 to 18 $\frac{1}{2}$ ; Wheal Kitty, 6s. to 7s. 6d.

Messrs. ABBOTT AND WICKETT, Stock and Share Brokers, and Mining Share Dealers, Redruth, write under date of Thursday, May 10:—In spite of the little improvement in tin, the Cornish Share Market has not shown much animation during the past week, and prices, on the whole, are lower. Wheal Grenville have been the principal exception, and have been in demand, closing about 19. Dolcoath lower and depressed on the delay in the pumping arrangements from the late rain. A fair business in Killfret, Tin Crofts, and West Kitties. Closing quotations herewith (four o'clock):—Blue Hills,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Carn Brea, 10 $\frac{1}{2}$  to 11; Cook's Kitchen,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Dolcoath, 70 to 71; East Pool, 10 $\frac{1}{2}$  to 11; Killfret, 3 $\frac{1}{2}$  to 3 $\frac{3}{4}$ ; Phoenix,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; Polberro, 1 to 1 $\frac{1}{2}$ ; South Condurrow,  $\frac{1}{2}$  to  $\frac{3}{4}$ ; South Croft, 2 $\frac{1}{2}$  to 3; South Frances, 1 $\frac{1}{2}$  to 1 $\frac{3}{4}$ ; Tincroft, 12 $\frac{1}{2}$  to 13; West Frances, 2 $\frac{1}{2}$  to 3; West Kitty, 6 $\frac{1}{2}$  to 7; Wheal Agar, 2 $\frac{1}{2}$  to 3; Wheal Bassett, 2 $\frac{1}{2}$  to 3; Wheal Grenville, 18 $\frac{1}{2}$  to 19 $\frac{1}{2}$ ; Wheal Kitty,  $\frac{1}{2}$  to  $\frac{3}{4}$ . Tin, 72 $\frac{1}{2}$ .

## MANCHESTER.

Messrs. JOSEPH R. and W. P. BAINES, Stock and Share Brokers, Queen's Chambers, 7, Market-street, write, May 10, 1894 (noon):—The past week has been for the most part a very idle one as regards new business; the fortnightly settlement coming in to be followed almost immediately by the Whitsuntide holidays. It is not surprising then, that, with several factors in the market to counteract the cheapness of money, that prices are generally lower throughout the several divisions of the market. Home Rails, whilst showing, as compared with last Thursday, declines in large numerical majority, do not at the same time furnish many of distinct extent, and the latest prices are in some instances above the worst. Sheffield Deferred, Metropolitan District, and Barwick's all show small advance, but all the rest, where altered at all, are lower, Lancashire and Yorkshire being most prominent with a fall of  $\frac{1}{2}$ , the rest being in small fractions, and of these Caledonian Deferred ( $\frac{1}{2}$  to  $\frac{3}{4}$  down) stand well out in the extent of falls. Americans, whilst fluctuating on the other side, have not made many very decided moves there, but the exigencies of operators on this side has contributed to weakness, and in this respect Louisvilles seem to have come off worst, the fall in these amounting to  $\frac{1}{2}$ . Milwaukee are \$1, New York Central \$1, Atchafalpa Income Bonds \$2, ditto ordinary \$1 $\frac{1}{2}$ , Ohio 1st \$1 $\frac{1}{2}$ , and Union Pacific \$1 to \$1 $\frac{1}{2}$ , besides a lot of others fractionally down. Readings alone show a rise, and that only of  $\frac{1}{2}$ . Canadians show Pacifics unchanged, but Grand Trunk issues are all practically lower, with the single exception of Guaranteed, which are put  $\frac{1}{2}$  better. In Mexican Ordinary are  $\frac{1}{2}$  down, and First Preference  $\frac{1}{2}$  up, the Second Preference remaining without change on nominal quotations. Consols are credited with a rise of  $\frac{1}{2}$  on the week. In Colonial Government Bonds, &c., the only changes are as follows:—viz.:—Higher: New Zealand Inscribed 1, South Australia Registered 1.—Lower: New South Wales Inscribed  $\frac{1}{2}$ . In foreigner the alterations, whilst not numerous, are contradictory. They are as follows:—Higher: Italian Rentes 1 $\frac{1}{2}$ , Spanish Four per Cent.  $\frac{1}{2}$ , and Egypt Unified  $\frac{1}{2}$ .—Lower: Mexican Six per Cent. 1 $\frac{1}{2}$ , Uruguay Three and a Half per Cent. 1 $\frac{1}{2}$ , Argentine Six per Cent. 1, ditto Five per Cent.  $\frac{1}{2}$ , and Turkish Group IV.  $\frac{1}{2}$ . Home Corporation Stocks, &c. with hardly anything changing hands here, except a few dealings in Manchester issues and one or two lots of Dewsbury Three and a Half per Cent., show a few advances and those only in the way of changed quotations.—Higher: Liverpool Three and a Half per Cent. 1, Birmingham Three and a Half per Cent.  $\frac{1}{2}$ , and Manchester Four per Cent.  $\frac{1}{2}$ . Business from the miscellaneous classes has been very quiet, Consolidated Banks have been done repeatedly, and Ship Canal issues have moved more than they did last week, but beyond those the transactions have been very straggling, and altogether the total is but a poor one. As regards current quotations, excepting banks, most departments show lower prices to be in majority, but the extent of fall is not of much moment in any case.

BANKS, with very little doing beside Consolidateds, show the following changes in prices:—Higher: Manchester and County,  $\frac{1}{2}$ ; Bank of Liverpool,  $\frac{1}{2}$ ; Imperial Ottoman,  $\frac{1}{2}$ ; and Consolidated, 1-16 to  $\frac{1}{2}$ . Lower: Imperial of Persia,  $\frac{1}{2}$ ; and District,  $\frac{1}{2}$ .

INSURANCE.—Manchester Fire has furnished nearly all the dealings marked, and prices are lower in nearly all instances where change is made at all. Higher: Royal,  $\frac{1}{2}$ . Lower: Liverpool and London and Globe,  $\frac{1}{2}$ ; British and Foreign Marine,  $\frac{1}{2}$  to  $\frac{1}{4}$ ; Reliance, 1-16; and Sea, 1-16.

COAL, IRON, &c.—Very little business doing. Richard Evans A have recovered to the extent of  $\frac{1}{2}$ , but the rest of alterations are on the downward side. Bolckow Vaughans Ordinary fully paid are  $\frac{1}{2}$ . Cammells 1 $\frac{1}{2}$ , Ebbw Vale 3-16, Rhymney 6d., and Tredegar A  $\frac{1}{2}$  lower.

MINES.—Tintos,  $\frac{1}{2}$  higher. De Beers  $\frac{1}{2}$ , Consolidated Gold Fields  $\frac{1}{2}$ , Cape Copper 1-16, and Ooregum 1-16 lower.

COTTON SPINNING, &c.—No improvement to report from this market. Where business is forced very low prices indeed have to be taken, and without taking such low prices business is well nigh impossible. Wherever any change is made in nominal figures case is to be found, and still buyers hold quite aloof.

TELEGRAPH.—Direct U.S. Cable and Anglo Ord. ary and Preference are each a  $\frac{1}{2}$  higher, whilst West India and Panama are  $\frac{1}{2}$  lower, these comprising the whole of the movements, and there being no transactions reported here therein.

BREWERY.—Allsops have gone ahead again, making a further rise of 3 on the week. On the other hand, Guinness are put 4 down. The other changes marked, are:—Higher: Hardy's Crown  $\frac{1}{2}$ , and Tamplins  $\frac{1}{2}$ . Lower: Chesters, and Manchester 1-16.

MISCELLANEOUS.—Suez Canal are  $\frac{1}{2}$  and Hudson's Bays  $\frac{1}{2}$  higher. On the other side, Brunner Mond's are  $\frac{1}{2}$ , Gas Light and Coke A 1, Imperial Continental Gas 2, Ship Canal Ordinary  $\frac{1}{2}$ , Preference  $\frac{1}{2}$ , and Debentures  $\frac{1}{2}$  lower. Northern Assets, too, are 2s. lower, besides several others of very small amount, amongst which is British South Africa, with fall of 1s. 6d.

LATER (4 P.M.).—In home rails, alterations are few and unimportant, but Great Northern A. In Canadians, Grand Trunk, said to be under influence since forced closing, went flat for a time, but recovered somewhat later on. Americans dull, and still drooping for the most part, Louisvilles again being about the weakest spot. Ship Canal shares have had a brisk rally to-day, Ordinary, which began at 2 9-16 to 2 11-16, going to £2 18s. 9d. to £3, and

Preference beginning at 3 $\frac{1}{2}$  to 3 11-16, going to 2 13-16 to 3 $\frac{1}{2}$ , but the Ordinary, at any rate, do not quite hold the best, being about 1-16 off the top at the finish.

## SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, Stockbroker and Ironbroker (May 10), writes:—During the past week the markets has been quiet, although trade prospects remain favourable. The Board of Trade Returns issued this week show considerable increases both in exports and imports. The fortnightly settlement is now in progress, and transactions entered into are for account, May 30—a 19 days' account.

In shares of coal, iron, and steel companies prices are generally lower, owing to the fear of a strike among the Lanarkshire and Ayrshire miners. Bolckow Vaughan are at 5 $\frac{1}{2}$ ; Ebbw Vale, 9 1-16; Marbella Iron, 58s. 6d.; Niddrie and Benhar, 47s.; Rhymney, 27s. 6d.; Steel Company of Scotland, 59s.; Stewart and Clydesdale, 8 $\frac{1}{2}$ ; and Wilsons and Clyde Coal, 8 13-16.

In shares of copper concerns there has been more business doing, especially in Tharish, which have improved to 92s., and Tinto to 14 15-16. Cape are at 28s. 9d., Copiapo 35s., and Libiola 62s. 6d.

In shares of gold and silver mines a fair amount of business has been done, but prices are irregular. Montana improved from 5s. 1 $\frac{1}{2}$ d. to 6s. 1 $\frac{1}{2}$ d. on the announcement of an output valued at \$64,100, against \$46,950 expenses. The returns from the various Australian, African, and Indian mines are encouraging. Both Mysore and Ooregum returns seem likely to improve, especially the latter, as they are increasing the stamping power for tailings. The first return has been announced from the Lisbon-Berlyn—658 ounces—which is considered good. Next month's return will be obtained from double the number of stamps, and is, therefore, likely to be good. African Gold Recovery are at 28s. 6d.; American Belle, 2s.; Bechuanaland, 27s. 6d.; British South Africa Chartered, 31s. 9d.; Broken Hill Proprietary, 53s. 6d.; Caratal, P.C.; Consolidated Gold Fields of South Africa, 49s.; Daw Dawn P.C., 4s.; Gold Fields of Mysore, 22s. 9d.; Idaho, 1s. 7 $\frac{1}{2}$ d.; La Plata, 7d.; Mexican Gold and Silver Recovery, 11s.; May Consolidated, 10s.; New Guston, 14s.; Nouveau Monde, 3d.; Oceana Transvaal, 48s.; Orita, 2s. 6d.; Sheba, 27s.; South Simmer and Jack, 30s.; Silver King, 3s.; Sutherland Reef, 4s. 9d.; and United African Land, 11s.

In shares of miscellaneous companies prices are steady. In Oil companies prices are generally lower, including Broxburn and Pumpherton. Young's Oil offered at 24s. 6d. The meeting of Broxburn will be on May 16. Law's Chemical are at 6 $\frac{1}{2}$ . Nobel's Explosives, 14; Roburite Explosives, 30s.; and White Lead, 4s. to 5s.

## EDINBURGH.

Messrs. THOMAS MILLER and SONS, Stock and Share Brokers, 69, Hanover-street, Edinburgh, report as follows under date of May 10: The market has been quiet. In railways Caledonian Deferred has fallen from 45 13-16 to 45 $\frac{1}{2}$ , North British from 41 $\frac{1}{2}$  to 41 $\frac{1}{2}$ , Glasgow and South Western from 105 to 104 $\frac{1}{2}$ , Brighton Deferred from 153 $\frac{1}{2}$  to 153 $\frac{1}{2}$ , Midland from 155 to 154 $\frac{1}{2}$ , South Eastern Deferred from 82 to 81 $\frac{1}{2}$ . The business in debenture, guaranteed, and other high-class stocks has been done at advancing prices. Canadians have shown weakness, and Americans also are lower. In banks Bank of Scotland have risen from 327 to 329, British Linen from 352 to 353, Clydesdale from 20 13-16 to 20 15-16. Commercial have receded from 67 $\frac{1}{2}$  to 67 $\frac{1}{2}$ . In insurance shares North British and Mercantile have advanced from 35 to 35 $\frac{1}{2}$ , Liverpool, London and Globe from 46 $\frac{1}{2}$  to 46 15-16, Standard Life from 57 $\frac{1}{2}$  to 58 $\frac{1}{2}$ , English and Scottish Law Life from 11 $\frac{1}{2}$  to 11 $\frac{1}{2}$ . Alliance have declined from 9 $\frac{1}{2}$  to 9 $\frac{1}{2}$ , Caledonian from 29 $\frac{1}{2}$  to 28, Steel shares from 63s. 6d. to 58s. 9d., Arizona Copper from 7s. 3d. to 7s., Rio Tinto from 14 9-16 cum. to 14 15-16 ex. div. Mason and Barry have fallen from 56s. 3d. cum. to 50s. 6d. ex. div. Broxburn oil have receded from 8 $\frac{1}{2}$  to 8 $\frac{1}{2}$ , Young's from 26s. 9d. to 24s. Missouri Land and Live Stock have declined from 17s. to 15s., New Zealand and Australian Land from 99 $\frac{1}{2}$  to 96, Edinburgh Tramways 2s. 6d. lower at 4 $\frac{1}{2}$ ; National Telephone 1s. 3d. higher at 4 $\frac{1}{2}$ ; Coats 2s. 6d. higher at 17 $\frac{1}{2}$ ; Distillers 1s. 3d. lower at 15 $\frac{1}{2}$ ; Younger's Preference 20s. higher at 124.

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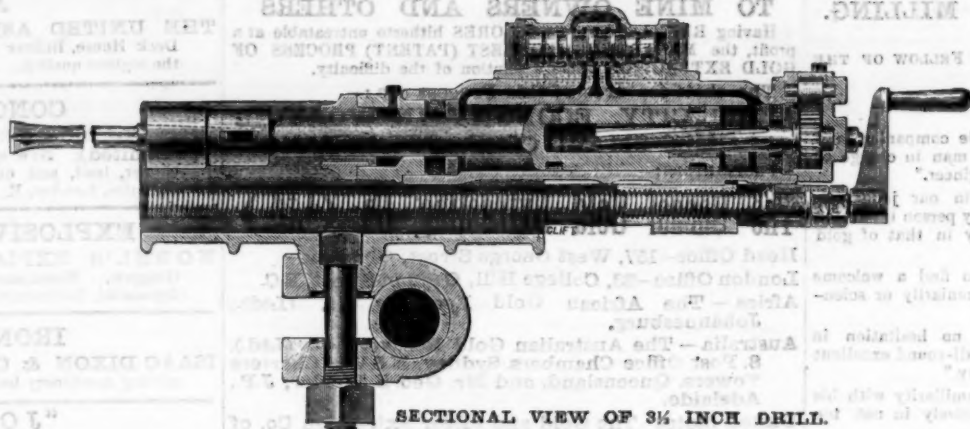


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## GATES ROCK AND ORE BREAKER.

Capacity in Tons of 2000 Pounds.

Size 0-2 to 4 tons per hour.	Size 3-10 to 20 tons per hour.	Size 6-30 to 60 tons per hour.
" 1-4 to 8 "	" 4-15 to 30 "	" 7-40 to 75 "
" 2-6 to 12 "	" 5-25 to 40 "	" 8-100 to 150 "

Passing 2 1/2 in. ring, according to character and hardness of material.  
Size 00 for Chemist's Sampling or the Laboratory, £25 complete.

**GREAT SAVING IN POWER.** Adjustable to  
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The principle involved in this Breaker acknowledged to be the greatest success ever introduced into Stone Breaking machinery.

Send for Catalogue, containing over 500 references of Contractors, Miners, Railway Companies, Cement Makers, etc.

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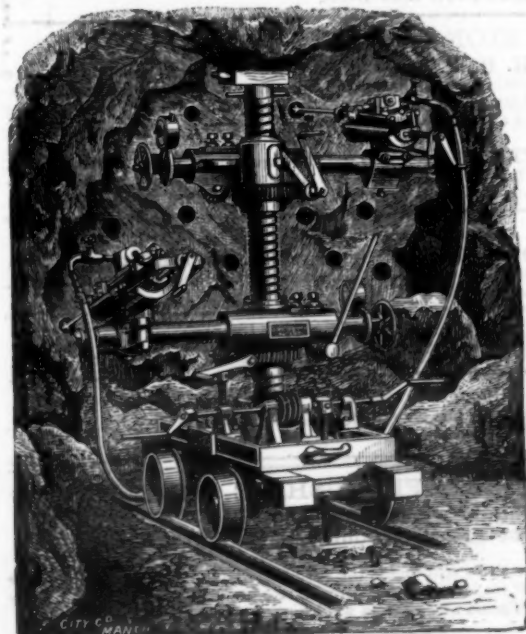
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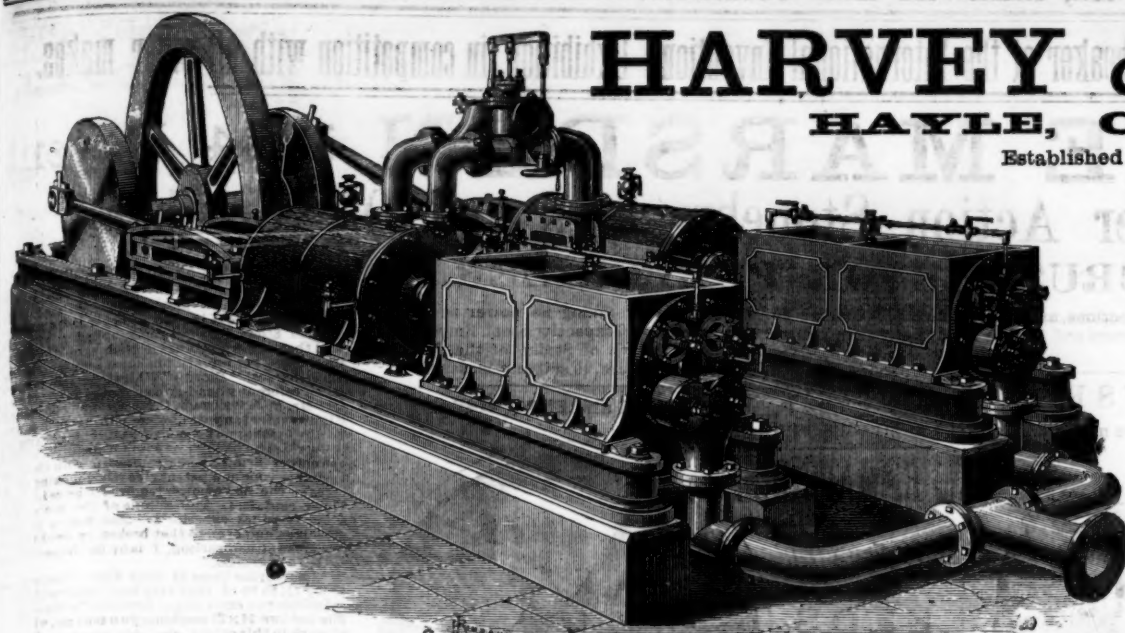
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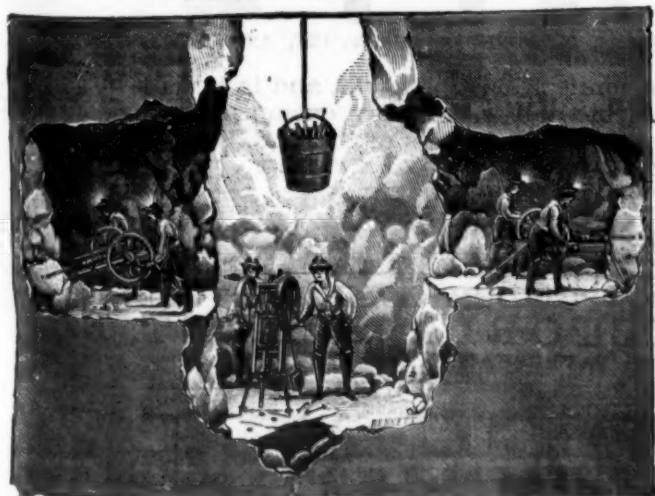
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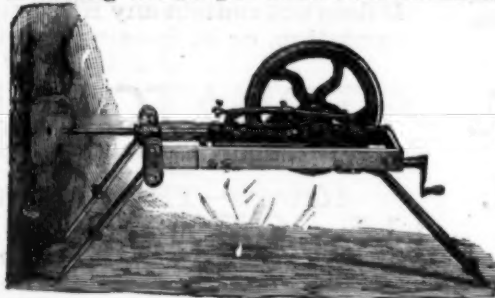
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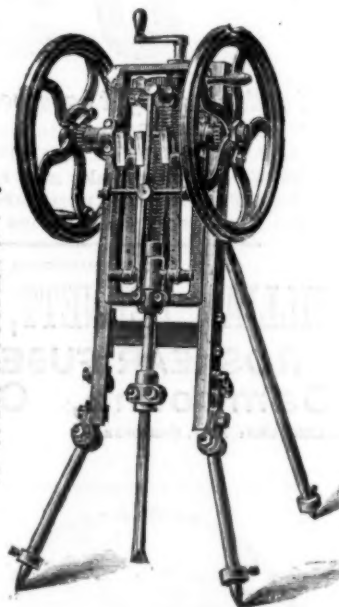
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"The Fine Crusher we had from you in August last is an excellent pulverizer, and rapidly reduces hard material to a fine powder."

"The Pulverizer has now been working two months, and answers its purpose most satisfactorily."

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"I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone and bring it out like flour."

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"Our experience is that the motion and mechanical arrangements of your machine are the best for pulverizing that we have ever met with."

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"As I once before stated, your machine is a perfect pulverizer."

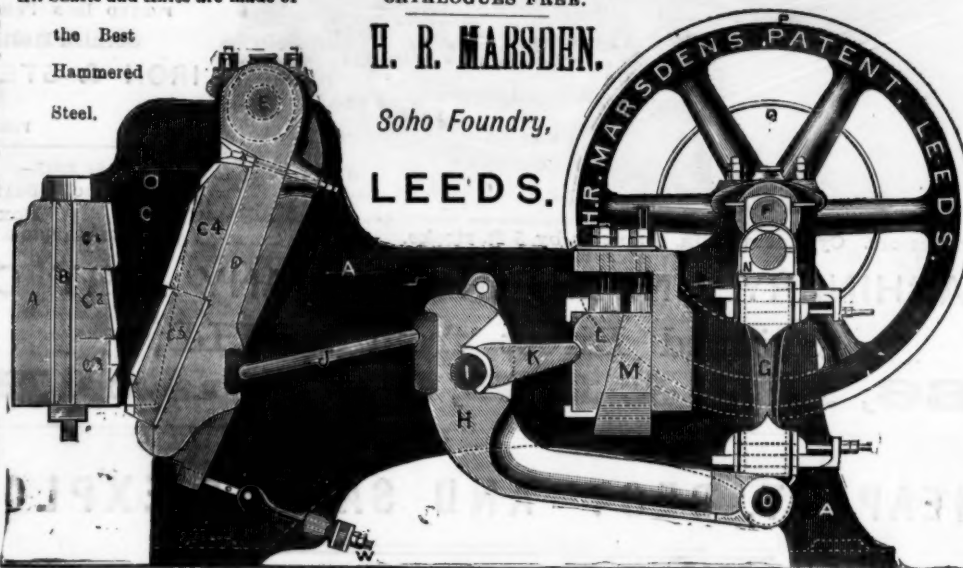
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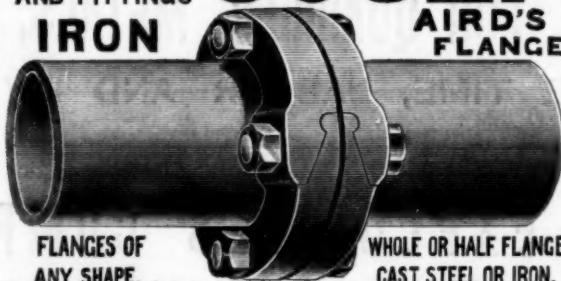
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SCREWED AND  
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AND FITTINGS  
IRON

# JOSEPH AIRD

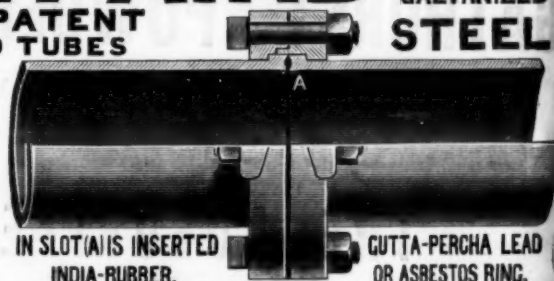
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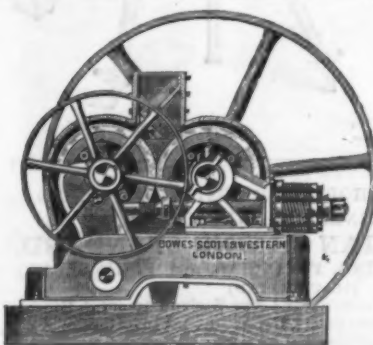
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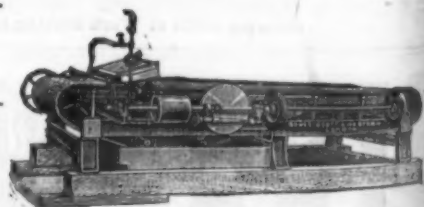
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